

APPENDIX **A**

Glossary

Introduction

This appendix is an authoritative source for terms used in mapping, charting, and geodesy used in the nautical charting program. Terms and definitions are of specific cartographic interest and may be found in this manual, on individual charts of maps, applicable source material, or encountered in archival research.

Where possible, contradictory, controversial, incomplete, or duplicative definitions have been excluded from this Glossary. Multiple definitions for a single term are included where appropriate. Definitions used in this Glossary have been taken from authoritative government sources, but chiefly from the U.S. Department of Commerce, Coast and Geodetic Survey, *Nautical Chart Manual, Seventh (1992) Edition, Volume Two: Definitions, Abbreviations, Symbolology, and References*, Washington, DC, 1992. Words set in bold type, within definitions, are defined elsewhere in this Glossary.

This appendix is intended to serve both as a basic reference document and tutorial. Although it is true that the working vocabulary of most mariners is less extensive than presented here, mariners are encouraged to become familiar with the contents of this appendix. As the classic text, *Mixter's Primer of Navigation* (Mixter, G.W., edited by McClench, *Primer of Navigation*, Fifth Edition, Van Nostrand Reinhold, New York, NY, 1967, p. 143), notes:

“It is not sufficient to partially understand a chart. The navigator must train himself to interpret the meaning of every mark on a chart and to convey every detail he observes along the coast or at sea into the symbols and terms used on charts.”

A Strategy for Study

It is very much easier to learn the many terms in this Glossary if attention is paid to the logical relationships between or among similar words. For example, the terms *mud, clay, silt, sand, stones, gravel, pebble, shingle, cobble, rock, and boulder* are obviously related. Indeed, all are descriptors used in Chart No. 1 to describe the “nature of the bottom.” In increasing order of particle diameter, these are clay (<0.002 mm), silt (0.002 mm to 0.0625 mm), sand (0.625 mm to 2 mm), gravel (2 mm to 4 mm), pebble (4 mm to 64 mm), cobble (64 mm to 256 mm), and rock or boulder (>256 mm). Mud is used as a general term which includes both clay and silt. Stones are a general term, which includes gravel, pebble, and cobble. Shingle consists of an aggregate of stones ranging from 16 mm to 256 mm in diameter. Chart No. 1 is a useful source for related terms.

It also helps to relate the terms defined in this Glossary to practical aspects of navigation and/or seamanship. Think about the relevance of each of these terms to typical voyages that you might make. Continuing the example given in the above paragraph, terms relating to the nature of the bottom have practical significance for evaluating the suitability of a place to anchor and/or the type of anchor to deploy if the vessel is equipped with more than one anchor. Thus, for example, silt and gravel generally offer only poor holding power, and clay is often regarded as having good holding qualities. A burying anchor is best for mud and sand bottoms, whereas a hooking anchor is preferable for rocky bottoms.

To help group terms, it may be useful to refer to the various categories provided in Chart No. 1. For example, Section F of Chart No. 1, “Ports,” includes many of the following related terms: *breakwater, groin,*

mole, quay, wharf, pier, gridiron, landing, jetty, dock, and slip. Read the definitions in the Glossary, taking care to note similarities and differences among these terms. On your next voyage into waters with these objects, compare the chart notations with what you observe.

Authoritative, But Not Exhaustive

Although intended to be authoritative, this Glossary is far from a complete listing of terms related to

nautical charts. Space constraints preclude listing every potentially relevant term—and not even all the terms used in Chart No. 1, or this manual, are included herein. Continuing with “nature of the bottom” descriptors, this Glossary omits such terms as *radiolaria, pteropods, polyzoa, cirripedia,* and *fucus,* for example.

Finally, this Glossary omits terms so common, e.g., bell, boat, etc., as to be understood by virtually all mariners.



Abandoned. An adjective referring to an artificial facility no longer being used for its original purpose, as in “abandoned mine.” The term may be used with a symbol (e.g., beside an airport symbol, or with a place name, e.g., Elma (Abandoned)).

Abys. A very deep, unfathomable place. The term is used to refer to a particular deep part of the ocean, or to any part below 300 fathoms.

Accretion. The gradual building up of land over a long period of time, solely by the action of the forces of nature, on a beach by deposition of water or airborne material. Artificial accretion is a similar build-up of land by deliberate means. Also called *aggradation.*

Adrift. Afloat or unattached to shore or bottom.

Aerial cableway. A transportation device consisting of an endless cable supported on towers. Cars attached to the cable are used for moving people or materials.

Aeronautical beacon. A visual aid to navigation, displaying flashes of white or colored light or both, used to indicate the location of airports, landmarks, and certain points of the federal airways in mountainous terrain and to mark hazards.

Aeronautical light. A luminous or lighted aid to navigation intended primarily for air navigation. One intended primarily for marine navigation is called a “marine light.” Often shortened to “aero light.”

Aeronautical radiobeacon. A radiobeacon whose service is intended primarily for the benefit of aircraft.

Afloat. Floating, as opposed to being aground.

Aground. Touching, resting, or lodged on the bottom of shallow water. The opposite is afloat. When a vessel rests on something solid other than the blocks in a drydock or slipway it is said to be aground. A vessel “takes the ground” when the tide leaves it aground for want of sufficient depth of water, a fairly frequent occurrence in open docks.

Aid to Navigation (ATON). Buoys, beacons, fog signals, lights, radiobeacons, leading marks, radio position fixing systems, radars, inertial systems, and generally any charted or otherwise published device serving the interests of safe navigation. *See also: Navigational aid.*

Airfield. Landing facility for aircraft, usually without a passenger terminal. The services offered for aircraft supply and maintenance are substantially less than those of an airport (q.v.). Airfields usually have legal limits which are delineated at 1:50,000 and larger scale charts.

Airport. Landing facility for aircraft, usually with more than one runway and with facilities for handling passengers and air freight and for servicing aircraft. The legal limits of the airport are usually delineated at chart scales of 1:50,000 and larger.

Airstrip. Landing facility for aircraft consisting of a single runway, which is usually of gravel construction. Airstrips rarely have a boundary fence or a delineated legal limit.

Alternating. A light showing different colors alternately, or a continuous steady light, which shows a change of color.

- Altitude.** (1) The distance of a location above a reference surface. The most usual reference surface is sea level. (2) The distance of a location above the physical surface of the earth.
- Anchorage.** A place where a vessel anchors or may anchor. An area set apart for anchored vessels in a harbor. A suitable place for anchoring is sheltered from wind and sea, does not interfere with harbor traffic, and has a sea bottom that gives good holding to anchors. The anchorage space allotted to a vessel should include a circle with a radius equal to the combined length of anchor cable and ship. A depth of 7 to 8 fathoms at low water is usually considered sufficient for ordinary requirements. For additional types of anchorage, see Chapter 7.
- Anchorage chart.** A nautical chart showing prescribed or recommended anchorages. Such a chart may be a harbor chart overprinted with a series of circles, each indicating an individual anchorage.
- Apparent shoreline.** This is the seaward limit of marine vegetation, such as mangrove, marsh grass, or trees in water that would reasonably appear to the mariner from a distance to be the fast shoreline. The seaward limit of kelp, low grass in water, and other low-lying vegetation normally do not constitute an apparent shoreline.
- Approximate contour.** A contour substituted for a normal contour whenever there is a question as to its reliability (*reliability* is defined as being accurate within one-half the contour interval).
- Approximate position.** In charting, a position that is considered to be less than third-order accuracy, but is generally considered to be within 100 feet of its correct geographic location. The method of location may be an indication of the recorded accuracy.
- Aqueduct.** A conduit or artificial channel for the conveyance of water, often elevated, especially one for the conveyance of a large quantity of water that flows by gravitation.
- Archipelago.** An area of water studded with many islands or with a group of islands; also, such a group of islands.
- Arc of visibility.** The portion of the horizon over which a lighted aid to navigation is visible. The arc of a light sector, designated by its limiting bearings as observed from seaward.
- Area feature.** By definition, a feature extending over an area. It is represented on maps by an outline, a solid or screened color, cross-hatching, a regular pattern of symbols spread over the area, or a combination of these.
- Areal feature.** A topographic feature, such as sand, swamp, vegetation, etc., which extends over an area. It is represented on the published map or chart by a solid or screened color, by a prepared pattern of symbols, or by a delimiting line.
- Area to be avoided.** A routing measure comprising an area within defined limits in which either navigation is particularly hazardous or it is exceptionally important to avoid casualties and which should be avoided by all ships, or certain classes of ship.
- Arm of the sea.** A narrow portion of the sea projection from the main body. The expression is often shortened to “arm.”
- Arroyo.** The course of an intermittent stream steep-cut in loose earth; a coulee; a steep-walled trenchlike valley. (Local in Southwest.)
- Articulated light.** An articulated light is a vertical pipe structure that oscillates around a universal coupling connected to a sinker. The structure is kept upright by the buoyancy of a submerged floatation chamber. It is designed primarily to mark narrow channels with greater precision than conventional buoys.
- Artificial harbor.** A harbor where the desirable shelter from wind and sea has been obtained artificially by the building of moles, piers, breakwaters, and jetties. Also applied to harbors created by sinking concrete barges, vessels, and the like to form a temporary sheltered anchorage. *See also:* **Natural harbor.**
- Artificial island.** An island constructed for the purpose of mineral or energy development.
- Atoll.** A coral island or islands, consisting of a belt of coral reef surrounding a central lagoon.
- Audible aid to navigation.** An aid to navigation transmitting information by sound waves.
- Authorities note.** The note included on a chart which gives the names of the federal agencies that have contributed to the information used in the compilation.
- Awash.** Situated so that the top is intermittently washed by waves or tidal action. The term applies both to fixed objects such as rocks, and to floating objects with their tops flush with or slightly above the surface of the water. *See also:* **Rock awash;**

Submerged.

Axis. (1) Any line along which measurements are made in determining the coordinates of a point, or any line from which angles are measured for the same purpose. An axis usually serves as a line reference such that one of the coordinates of a point lying on the axis is zero. (2) A line with respect to which a geometric figure is symmetrical. (3) Any line about which a body rotates or revolves. (4) A line connecting two distinguished points (e.g., the magnetic poles of the earth are joined by the magnetic axis).

Azimuth. A horizontal angle reckoned clockwise from the meridian.

Back range. A range observed astern, particularly one used as guidance for a craft moving away from the objects forming the range.

Backshore. That part of a beach which is usually dry, being reached only by the highest tides, and by extension, a narrow strip of relatively flat coast bordering the sea. *See also: Foreshore.* That zone of the shore or beach lying between the foreshore and the coastline and acted upon by waves only during severe storms, especially when combined with exceptionally high water. Also *backbeach*. It comprises the *berm* or *berms*.

Bald. A high rounded knob or mountain top, bare of forest. (Local in southern states.)

Bank. (1) An elevation of the seafloor typically located on a shelf and over which the depth of water is relatively shallow but sufficient for safe surface navigation. Reefs or shoals, dangerous to surface navigation, may rise above the general depths of a bank. (2) A shallow area of shifting sand, gravel, mud, etc., as a sand bank, mud bank, etc. (3) A ridge of any material such as earth, rock, snow, etc., or anything resembling such a ridge, as a fog bank or cloud bank. (4) The edge of a cut or fill. (5) The margin of a watercourse. (6) A number of similar devices connected so as to be used as a single device.

Bar. A ridge or mound of sand, gravel, or other unconsolidated material below the high-water level, especially at the mouth of a river or estuary, or lying a short distance from and usually parallel to the beach, and which may obstruct navigation.

Bare rock. A rock extending above the datum of mean high-water. On NOAA charts, bare rock symbols are used for rocks extending more than 1 foot above mean high water on the Atlantic coast, and extend-

ing more than 2 feet above the mean high water on the Pacific coast. *See: Rock; Rock awash; Sunken rock.*

Barrier beach. A bar essentially parallel to the shore, the crest of which is above high water.

Barrier island. A detached portion of a barrier beach between two inlets.

Barrier lagoon. A bay roughly parallel to the coast and separated from the open ocean by barrier islands. Also the body of water encircled by coral islands and reefs, in which case it may be called an "atoll lagoon."

Barrier reef. A coral reef which roughly parallels land but is some distance offshore, with deeper water adjacent to the land, as contrasted with a "fringing reef" closely attached to the shore. *See also: Fringing reef.*

Bar scale. A line or series of lines on a chart, subdivided and labeled with the distances represented on the chart. Also called *graphic scale*. *See also: Scale.*

Bascule bridge. A single- or double-leaf span, with the shoreward ends hinged, allowing the span to be elevated vertically.

Basic survey. A hydrographic survey so complete and thorough that it does not need to be supplemented by other surveys and is adequate to supersede, for charting purposes, all prior hydrographic surveys of the area.

Basin. (1) A depression of the seafloor more or less equidimension in plan view and of variable extent. (2) An area of water surrounded by quay walls, usually created or enlarged by excavation, large enough to receive one or more ships for a specific purpose. *See also: Graving dock; Nontidal basin; Scouring basin; Tidal basin; Turning basin.* (3) An area of land which drains into a lake or sea through a river and its tributaries. (4) A nearly land-locked area of water leading off an inlet, firth, or sound.

Basin, tidal. A basin affected by tides, particularly one in which water can be kept at a desired level by means of a gate.

Bathymetric chart. A topographic map of the ocean floor, or the bed of a lake.

Bathymetry. The determination of ocean depths. The general configuration of seafloor as determined by profile analysis of depth data.

- Bay.** (General) An indentation of the coast; an embayment; a subordinate adjunct to a larger body of water; a body of water between and inside of two headlands (according to Geneva Convention). A well-marked indentation whose penetration is in such proportion to the width of its mouth as to contain landlocked waters and constitute more than a mere curvatures of the coast. The area of such an indentation must be as large as or larger than the semi-circle whose diameter is a line drawn across the mouth of the indentation.
- Bay deltas.** Deltas formed at the mouths of streams which discharge into bays or estuaries. Their advance toward the bay mouths often extinguishes lagoons behind bay bars or completely fills open bays, thus simplifying the shoreline. When the delta forms at the head of the bay, it is a *bay-head delta*.
- Baymouth bar.** A bar extending partly or entirely across the mouth of a bay.
- Bayou.** A minor, sluggish waterway or estuarial creek, generally tidal or with a slow or imperceptible current, and with its course generally through lowlands or swamps, tributary to or connecting with other bodies of water. Various specific meanings have been implied in different parts of the southern United States. Sometimes called *slough*.
- Beach.** The zone of unconsolidated material that extends landward from the low-water line to the place where there is a marked change in material or physiographic form, or to the line of permanent vegetation (usually the effective limit of storm waves). A beach includes foreshore and backshore. The beach along the margin of the sea may be called a *seabeach*.
- Beach berm.** A nearly horizontal part of the beach or backshore formed by the deposit of material by wave action. Some beaches have no berms, others have one or several.
- Beach face.** The section of the beach normally exposed to the action of the wave uprush. The foreshore of a beach.
- Beacon.** A lighted or unlighted aid to navigation attached to the earth's surface. (Lights and daybeacons both constitute "beacons.")
- Beam compass.** A drafting instrument for drawing circles with a large radius. The point and pen, or pencil tip, are separate units, mounted to slide and clamp on a long bar or "beam" so that the distance between them is equal to the desired radius.
- Bearing.** The horizontal direction of a line of sight between two objects on the surface of the earth.
- Bed.** The ground upon which a body of water rests. The term is usually used with a modifier to indicate the type of water body, as river bed or sea bed. *See also: Bottom.*
- Bell buoy.** A steel float surmounted by a short skeleton tower in which the bell is fixed. Most bell buoys are sounded by the motion of the buoy in the sea. In a few buoys, the bells are struck by compressed gas or electrically operated hammers.
- Bench.** (1) A level or gently sloping erosion plane inclined seaward. (2) A nearly horizontal area at about the level of maximum high water on the sea side of a dike.
- Berm.** The nearly horizontal portion of a beach or backshore having an abrupt fall and formed by deposition of material by wave action, and marks the limit of ordinary high tides.
- Berth.** The place where a vessel lies when tied up or anchored. A place for securing a vessel.
- Bifurcation.** A division of a channel into two branches, a fork.
- Bifurcation buoy.** A buoy which, when viewed from a vessel approaching from the open sea, or in the same direction as the main stream of flood current, or in the direction established by appropriate authority, indicates the place at which a channel divides into two. *See also: Junction buoy.*
- Bight.** A bend or curve; a bend in a coast forming an opening bay; a small open bay formed by an indentation in the coast; a minor feature which affords little protection for vessels.
- Blue tint curve.** A blue tint is shown in the water areas to the curve, which is considered the danger curve for vessels expected to use that particular chart.
- Bluff.** A bold, steep headland or promontory. A high, steep bank or low cliff.
- Bluffs and cliffs.** A rigorous definition of either a bluff or cliff, or a precise distinction between the two, is difficult if not impossible. A feature that is called a cliff in one area may be called a bluff in another. However, most references describe a cliff as a near vertical surface composed of rock. Other promontories with steep surfaces, but not exhibiting both the near vertical face and the rock structure should be called bluffs.
- Boat harbors and marinas.** Areas of sheltered water, generally within harbors or ports, set aside

for the use of small craft, usually with moorings, buoys, and, in the case of marinas, berthing facilities.

Boathouse. A building at or near a shore for storage of boats.

Bog. A small open marsh which yields under the foot.

Bold coast. A prominent land mass that rises steeply from the sea.

Bollard. A post (usually steel or reinforced concrete) firmly secured on a wharf, quay, etc., for mooring vessels by means of lines extending from the vessel and secured to the post.

Boom. A floating barrier of timber used to protect a river or harbor mouth or to create a harbored area for storage purposes. Also called *log boom*.

Border break. A cartographic technique used when it is required to extend cartographic detail of a map or chart beyond the neatline into the margin. This technique may eliminate the necessity of producing an additional sheet. Also called *blister*.

Border of chart. The neatline defining the limits of the area charted.

Bore. A very rapid rise of the tide in which the advancing water presents an abrupt front of considerable height. Bores generally occur in shallow estuaries where the range of tide is large.

Bottom. The ground under a body of water. The terms *bed*, *floor*, and *bottom* have nearly the same meaning, but *bed* refers more specifically to the whole hollowed area supporting a body of water, *floor* refers to the essentially horizontal surface constituting the principal level of the ground under a body of water, and *bottom* refers to any ground covered with water.

Bottom characteristics. Designations used on surveys and nautical charts to indicate the consistency, color, and classification of the sea bottom. Also called *nature* or *quality* or *character of the bottom*.

Bottom land. Lowland formed by alluvial deposit along a stream or in a lake basin; a flood plain.

Boulder. One of several descriptors of the “nature of the seabed” used in Chart No. 1 A detached water-rounded stone more than 256 mm in diameter (i.e., larger than a person’s head).

Boundary line. A line separating two areas. In specific cases, the word “boundary” is often omitted, as in state line; or the word “line” is omitted, as in

international boundary, county boundary, etc. The term *boundary line* is used to specify boundaries between political territories, as in state boundary lines between two states.

Bounding Meridian. A Meridian which is coincident with a part of the neatline on a chart.

Bounding parallel. A parallel which is coincident with a part of the neatline on a chart.

Bowditch. Popular title for Publication No. 9, *American Practical Navigator*.

Branch. A creek or brook, as used locally in southern states. Also used to designate one of the bifurcations of a stream, as a fork.

Breaker. A wave breaking on the shore, over a reef, etc. Breakers may be roughly classified into three kinds, although the categories may overlap: (1) spilling breakers break gradually over a considerable distance, (2) plunging breakers tend to curl over and break with a crash, and (3) surging breakers peak up, but then instead of spilling or plunging they surge up on the beach face.

Breakwater. A breakwater is a device protecting a shore area, harbor, anchorage, or basin from waves. A floating breakwater is a contrivance consisting of floating materials connected by mooring chains or cables attached to anchors or stone blocks in such a manner as to form a basin within which vessels may be protected from the violence of the waves. A breakwater may be attached to or separated from the shore. *See also: Jetty*.

Bridge. The term “bridge” means a lawful bridge over navigable waters of the United States, including approaches, fenders, and appurtenances thereto, which are used and operated for the purpose of carrying railroad traffic, or both railroad and highway traffic.

Brook. A stream of less length and volume than a creek, as used locally in the Northeast. Generally, one of the smallest branches or ultimate ramifications of a drainage system.

Buildings. Buildings exist in all sizes and shapes and exhibit various degrees of prominence. Those with true landmark value are discussed under **Landmark**. Many others, however, are sufficiently prominent so as to aid the mariner in becoming oriented, especially in harbor areas. These are buildings such as large warehouses, factories, maintenance facilities, etc., that will aid the mariner, for example, in identifying a particular berth.

- Built-up area.** An area where the buildings are so close together that for cartographic clarity a tint or hatching is used to indicate the extent of the area. Landmark buildings are usually depicted within the area. Cartographic agencies usually define by scale the extent of congestion required before the area tint or hatching is used, as well as the minimum dimensions of such areas or of clear areas within tinted or hatched areas.
- Bulk cargo.** Usually a homogeneous cargo stowed in bulk (i.e., loose in the hold and not enclosed in any container such as boxes, bales, bags, etc.). Bulk cargos may be free-flowing articles (such as oil, grain, or ore) which can be pumped or run through a chute or handled by dumping, or articles that require mechanical handling (such as coke, bricks, or pig iron).
- Bulkhead.** A structure or partition to retain or prevent sliding of the land. A secondary purpose is to protect the upland against damage from wave action. Bulkheads are frequently filled behind, thereby increasing the utility of the adjacent land area.
- Buoy.** A floating object, other than a lightship, moored or anchored to the bottom, and an aid to navigation.
- Buoyage.** A system of buoys. One in which the buoys are assigned shape, color, and number distinction in accordance with location relative to the nearest obstruction is called a *cardinal system*. One in which buoys are assigned shape, color, and number distinction as a means of indicating navigable waters is called a *lateral system*. *See also: IALA Maritime Buoyage System.*
- Butte.** A lone hill, especially one with steep or precipitous sides.
- Cairn.** A mound of rough stones or concrete, particularly one serving or intended to serve as a landmark. The stones are customarily piled in a pyramidal or beehive shape.
- Caisson.** A watertight gate for a lock, basin, etc. A steel structure which either floats or slides into place to close the entrance to a dry dock, lock, or nontidal basin.
- Call letters.** Identifying letters, sometimes including numerals, assigned by competent authority to a radio station. In the United States such identification is assigned by the *Federal Communications Commission* (FCC).
- Canal.** (1) An artificial waterway for navigation. (2) A long, fairly straight natural channel with steep sloping sides. (3) Any watercourse or channel. (4) A sluggish coastal stream, as used locally on the Atlantic coast of the United States.
- Can buoy.** An unlighted buoy of which the upper part of the body (above the waterline), or the larger part of the superstructure, has the shape of a cylinder or nearly so. Also called *cylindrical buoy*.
- Canyon.** On the seafloor, a relatively narrow, deep depression with steep sides, the bottom of which generally has a continuous slope.
- Cape.** A relative extensive land area jutting seaward from a continent, or large island, which prominently marks a change in or interrupts notably the coastal trend.
- Captain of the Port.** The officer of the U.S. Coast Guard, under the command of a District Commander, so designated by the Commandant for the purpose of giving immediate direction to U.S. Coast Guard law enforcement activities within his assigned area.
- Cardinal point.** Any of the four principal directions; north, east, south, or west. Directions midway between cardinal points are called intercardinal points.
- Cardinal system.** A buoyage system generally used to indicate dangers where the coast is flanked by numerous islands, rocks, and shoals as well as to indicate dangers in the open sea. In this system the bearing (true) of the mark from the danger is indicated to the nearest cardinal point.
- Carse.** A low, fertile river bottom. (Scottish origin.)
- Cartographer.** One who practices cartography, particularly a member of the profession regularly concerned with any stage in the evaluation, compilation, design, or drafting of a map or chart.
- Cartographic feature.** A term applied to the natural or cultural items shown on a map or chart. The three main categories are: "point feature," "line feature," and "area feature."
- Cartographic license.** The freedom to modify manuscript information in order to improve the clarity of the chart or map.
- Cartography.** The art, science, and technology of making charts or maps, together with their study as scientific documents and works of art. In this context, maps may be regarded as including all types of maps, plans, charts and sections, three-dimensional models and globes representing the earth or any celestial body at any scale.

Cascade. A fall of water over steeply sloping rocks, usually comparatively small or one of a series.

Cataract. A waterfall, usually larger than a cascade, over a precipice.

Catwalk. *See:* **Fore-and-aft bridge.**

Causeway. A raised way, as for a road, across wet ground, or water. A causeway is a raised roadway of solid structure built primarily to provide a route across wet ground or an intertidal area.

Cautionary characteristic. Of a light, a unique characteristic which can be recognized as imparting a special cautionary significance (e.g., a quick flashing characteristic phase indicating a sharp turn in a channel).

Cavern. A large, natural, underground cave or series of caves. Often, but not always, used to imply largeness or indefinite extent to distinguish from “cave.”

Cay (also kay, key). A low, flat island of sand, coral, etc., awash or drying at low water; a term originally applied to the coral islets around the coast and islands of Caribbean Sea.

Ceja. The cliff at a mesa edge; an escarpment. Local in Southwest.

Central meridian. The line of longitude at the center of a map or chart projection. Generally, the basis for constructing the projection.

Centerline controlling depth. The controlling depth of a waterway, which applies only to the center of the waterway; it is usually the result of a reconnaissance-type survey consisting of only a few lines of soundings which do not provide adequate coverage to determine the controlling depth of the entire waterway.

Cerrito (or cerrillo). A small hill. (Local in Southwest.)

Cerro. Hill, highland; ridge. (Local in Southwest.)

Chain. A group of associated stations of a radionavigation system. A LORAN-C chain consists of a master station and two or more secondary stations.

Chalk. One of several descriptors of the “nature of the seabed” used in Chart No. 1 Chalk is soft earthy sandstone of marine origin, composed chiefly of minute shells. It is white, gray, or buff in color. Part of the ocean bed and shores and composed of chalk, notably the “white cliffs of Dover,” England. Chalk exhibits variable, but sometimes poor, holding qualities.

Channel. (1) That part of a body of water deep enough for navigation through an area otherwise not suitable. It is usually marked by a single- or double-line of buoys and sometimes by ranges. (2) The deepest part of a stream, bay, or strait, through which the main current flows. (3) A name given to certain large straits, as the English Channel. (4) A hollow bed through which water does or may run. (5) A band of radio frequencies within which a radio station must maintain its modulated carrier frequency to prevent interference with stations on adjacent channels. Also called *frequency channel*.

Channel, sea. A long, narrow, U-shaped or V-shaped shallow depression of the seafloor, usually occurring on a gently sloping plain or fan.

Characteristic. (1) The color and shape of a daymark or buoy or the color and period of light used for identifying the aid. (2) The identifying signal transmitted by a radiobeacon.

Characteristic color. Of a light, the unique identifying color (e.g., in the U.S. buoyage system, green lights are used only on black buoys or on horizontally banded black-and-red buoys with the topmost band black).

Characteristics of light. All particularities of a light, such as color, period, group number, visibility, height above sea level, and character. Also called *light characteristics*.

Characteristic phase. Of a light, the sequence and length of light and dark periods by which a navigational light is identified (i.e., whether fixed, flashing, interrupted, quick flashing, etc.).

Chart agent. Business establishments that are under contract with NOAA and that receive discounts for resale of nautical and aeronautical navigational charts and related publications to the general public at retail prices stipulated by NOAA.

Chart, bathymetric. A topographic map of the bed of the ocean.

Chart datum. The datum to which soundings on a chart are referred. It is usually taken to correspond to a low-water elevation.

Charted visibility. The extreme distance, shown in numbers on a chart, at which a navigational light can be seen. This may be the geographic range when limited by the curvature of the earth and the heights of the light and the observer or the luminous range when limited only by the intensity of the light, clearness of the atmosphere, and sensitivity of the observer's eyes.

- Chart, isogonic.** Chart showing magnetic declination with isogonic lines and the annual rate of change in declination with isoporic lines.
- Chartlet.** A corrected reproduction of a small area of a nautical chart which is pasted to the chart for which it is issued. These chartlets are disseminated in *Notice to Mariners* when the corrections are too numerous or of such detail as not to be feasible in printed form. (Also called: *block*, *block correction*, *chart amendment patch*.)
- Chart, Mercator.** A chart on the Mercator projection. This is the chart commonly used for marine navigation. In Mercator Chart, a rhumb line is a straight line.
- Chart, nautical.** A chart specifically designed to meet the requirements of marine navigation, showing depths of water, nature of bottom, elevations, configuration and characteristics of coast, dangers and aids to navigation. (Also called: *marine chart*, *hydrographic chart*, or simply *chart*.)
- Chart scale.** The ratio between a distance on a chart and the corresponding distance represented, as 1:80,000 (natural scale), or 30 miles to an inch (numerical scale). May be called *map scale* when applied to any map. *See also: Representative fraction.*
- Chart sounding datum.** The tidal datum to which soundings and drying heights on a chart are referred. It is usually taken to correspond to a low-water stage of the tide. Often shortened to “chart datum,” especially when it is clear that reference is not being made to a horizontal datum.
- Chasm.** A deep breach in the earth’s surface; an abyss; a gorge; a deep canyon.
- Chimney.** A label on a nautical chart which indicates a relatively small, upright structure projecting above a building for the conveyance of smoke.
- Circle, great.** The circle formed by the intersection of a sphere with a plane that passes through the center of the sphere. The shortest distance between any two points on a sphere is along the arc of a great circle connecting the two points.
- Circle of visibility.** That circle surrounding an aid to navigation and in which the aid is visible.
- Clay.** One of several descriptors of the “nature of the seabed” used in Chart No. 1. *See under: Mud.*
- Clearance, bridge.** Minimum vertical or horizontal space available for passage.
- Cliff.** Land arising abruptly for a considerable distance above water or surrounding land. *See also: Bluff.*
- Closed.** A manned aid temporarily discontinued for the winter season.
- Closing line.** The dividing line between inland waters and the marginal sea across the entrance of a true bay. *See also: Marginal sea.*
- Coast.** The part of the land next to the sea. This term includes natural appendages of the territory which rise out of the water, although they may not be of sufficient firmness to be inhabited or fortified. Shoals perpetually covered with water are not included under the term “coast.” Coast is the term used with reference to the land, while “shore” is the term used with reference to the sea.
- Coast charts.** These NOAA charts are published at scales from 1:50,000 to 1:150,000 and are intended for nearshore navigation inside outlying reefs and shoals, in entering or leaving bays and harbors of considerable size, and in navigating the larger inland waterways.
- Coastal confluence zone.** A coastal area of the United States which has an outer boundary of 50 nautical miles from shore or the 100-fathom curve, whichever is farther, and an inner boundary of the shoreline or the outer boundary of the harbor entrance, whichever is farther.
- Coastal plain.** Any plain which has its margin on the shore of a large body of water, particularly the sea, and generally represents a strip of geologically recent emerged sea bottom.
- Coastal waters.** (1) The U.S. waters of the Great Lakes (Erie, Huron, Michigan, Ontario, and Superior); (2) the territorial seas of the United States; and (3) those waters directly connected to the Great Lakes and territorial seas (i.e., bays, sounds, harbors, rivers, inlets, etc.), where any entrance exceeds 2-nautical miles between opposite shorelines to the first point where the largest distance between shorelines narrow to 2 miles as shown on the current edition of the appropriate NOAA chart used for navigation.
- Coasting.** Proceeding approximately parallel to a coastline (headland to headland) in sight of land, or sufficiently often in sight of land to fix the ship’s position by observations of land features.
- Coastline.** Generally, where the shore directly contacts the open sea, the line on the shore reached by

the ordinary low tides comprised the coastline from which the distance of three geographic miles is measured. The line has significance for both domestic and international law (in which it is termed the "baseline"), and is subject to precise definitions. Special problems arise when offshore rocks, islands, or other bodies exist, and the line may have to be drawn to seaward of such bodies.

Coastwise navigation. Navigation in the vicinity of a coast, in contrast with offshore navigation at a distance from a coast. *See also:* **Coasting.**

Cobble. One of several descriptors of the "nature of the seabed" used in Chart No. 1 *See under:* **Stones.**

COLREGS. Acronym for *International Regulations for Preventing Collisions at Sea*. Lines of demarcation delineating those waters upon which mariners must comply with the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS) and those waters upon which mariners must comply with the Navigation Rules for Harbors, Rivers, and Inland Waters (Inland Rules). The waters outside the lines are COLREGS waters. For specifics concerning COLREGS demarcation lines see: *U.S. Code of Federal Regulations* (CFR), Title 33, Navigation and Navigable Waters; Part 82, COLREGS demarcation lines.

Commissioned. An aid previously reported closed or withdrawn which has been placed in operation.

Compass course. (1) Course relative to compass north. (2) Compass direction. Horizontal direction expressed as angular distance from compass north.

Compass direction. Direction as indicated by compass without any allowances for compass error. The direction indicated by a compass may differ by a considerable amount from true or magnetic direction.

Compass, gyroscopic. A compass consisting of a gyroscope suspended so that its axis of rotation points north.

Compass, magnetic. A device that indicates direction by means of a magnet supported at its midpoint so that the magnet aligns itself with the local magnetic field. The end of the magnet, which points in the general direction of north, is marked.

Compass north. The uncorrected direction indicated by the north-seeking end of a compass needle. *See also:* **Magnetic north.**

Compass rose. A circle graduated in degrees, clock-

wise from 0° at the reference direction to 360°. Compass roses are placed at convenient locations on the Mercator chart or plotting sheet to facilitate measurement of direction.

Compilation. (1) The production of a new or revised map or chart, or portions thereof, from existing maps, aerial photographs, surveys, new data, and other sources. (2) The production of a map or chart, or portions thereof, from aerial photographs and geodetic control data, by means of photogrammetric instruments.

Containerized cargo. Cargo which is carried in sealed, specially constructed containers. In roll-on/roll-off container operations, truck trailers, complete with chassis and wheels, are rolled onto and off of special types of ships or barges by means of ramps. In lift-on/lift-off operations, containers are loaded and unloaded by means of high-speed shipboard or shore-based cranes.

Conterminous United States. Comprises the 48 states of the United States and the District of Columbia; all of the states exclusive of Alaska and Hawaii. They have common boundaries and are not separated by foreign territory or the high seas.

Continental borderland. A province adjacent to a continent, normally occupied by or bordering a continental shelf, that is highly irregular with depths well in excess of those typical of a continental shelf.

Continental margin. The zone, generally consisting of shelf, slope, and rise, separating the continent from the abyssal plain or deep sea bottom.

Continental rise. A gentle slope rising from the oceanic depths toward the foot of a continental slope.

Continental shelf. The submerged portion of a continent, which slopes gently seaward from the low-water line to a point where a substantial break in grade occurs, at which point the bottom slopes seaward at a considerable increase in slope until the great ocean depths are reached. The point of break defines the edge of the shelf, and the steeper sloping bottom the continental slope. Conventionally, the edge is taken at 100 fathoms (200 meters) but instances are known where the increase in slope occurs at more than 200 or less than 65 fathoms.

Contour. A line joining points of equal vertical distance above or below a datum. Such a line on a map is a type of Isoline.

Contour line. A line connecting points of equal el-

evation or equal depth. One connecting point of equal depth is usually called a fathom curve, or fathom line. *See also: Form line.*

Controlling depth. (1) The least depth in the approach or channel to an area, such as a port or anchorage, governing the maximum draft of vessels that can enter. (2) The least depth within the limits of a channel; it restricts the safe use of the channel to drafts of less than that depth. The centerline controlling depth of a channel applies only to the channel centerline; lesser depths may exist in the remainder of the channel. The mid-channel controlling depth of a channel is the controlling depth of only the middle half of the channel. *See also: Federal project depth.*

Conventional nautical charts. These charts are flat, printed reproductions published by NOAA of some portion of the navigational part of the earth's surface. Depending on their scale, these charts show the nature and shape of the coast, depth of the water, general configuration and character of the bottom, prominent landmarks, port facilities, cultural details, dredged channels, aids to navigation, marine hazards, magnetic variations, and seaward boundaries. Changes brought about by people and nature require that nautical charts be constantly maintained to aid safe navigation.

Coordinates. Linear or angular quantities, which designate the position of a point in relation to a given reference system.

Coral. In the strict sense, coral is a bottom-dwelling marine organism, which secretes an external skeleton of calcium carbonate and which frequently forms large, irregular colonies with numerous coral heads and pinnacle. In reality, coral formations are usually a mixture of coral and other marine organisms along with other debris and chemically precipitated rock. For shoreline mapping purposes, a rock or coral formation is a naturally occurring, consolidated rock, or coral mass, that differs conspicuously from adjacent objects and materials, and which is too large to be adequately represented on the shoreline map by a single rock (coral) symbol.

Coral head. A massive mushroom or pillar-shaped coral growth.

Coral reef. A reef made up of coral, fragments of coral and other organisms, and the limestone resulting from their consolidation.

Correction of soundings. The adjustment of soundings for any departure from true depth because of the method of sounding or any fault in the measur-

ing apparatus.

Coulee. A steep-walled, trenchlike valley; a wash, gulch, or arroyo through which water flows intermittently. (Western United States.)

Course. The intended horizontal direction of travel. It is measured from 0° at the reference direction clockwise through 360°; strictly for marine navigation, the term applies to the direction to be steered, which sometimes differs from the direction intended to be made good over the ground. The course is designated as true, magnetic, or compass, as the reference direction is true, magnetic, or compass north respectively.

Course, recommended. A line shown on a chart, which has been specially examined to ensure that it is free of dangers, and along which ships are advised to navigate. Also called *recommended track*.

Cove. A small, sheltered recess in a coast, often inside a larger embayment.

Covers and uncovers (or discovers). Expression intended to indicate an area of a reef or other projection from the bottom of a body of water, which periodically extends above and is submerged below the surface. Also referred to as *dries* or *uncovers*.

Crag. A steep, rugged rock; a rough, broken cliff of a projecting point of rock; also a detached fragment of a rock.

Crater. The bowl-shaped depression around the vent of a volcano or a geyser; also a hole formed by the impact of a meteorite, the detonation of a mine, or the like.

Creek. (1) A stream of less volume than a river, but larger than a brook. (2) A small tidal channel through a coastal marsh. (3) A wide arm of a river or bay.

Crest. The summit land of any eminence; the highest natural projection which crowns a hill or mountain, from which the surface dips downward in opposite directions.

Crevasse. A deep crevice, or fissure, especially in a glacier. A break in a levee or other stream embankment.

Crib. A permanent marine structure, usually designed to support or elevate pipelines; especially a structure enclosing a screening device at the offshore end of a potable water intake pipe. The structure is commonly a heavy timber enclosure that has been sunken with rocks or other debris.

Culture. Artificial features that are under, on, and above ground, which are delineated on a chart or map. These features include roads, trails, buildings, canals, sewer systems, and boundary lines. In a broad sense, the term also applies to all names, other identification, and legends on a chart or map.

Cupola. A label on a nautical chart which indicates a small dome-shaped tower or turret rising from a building.

Current. Generally, a horizontal movement of water. Currents may be classified as tidal and nontidal.

Cut-off. A new, and relatively short, channel formed when a stream cuts through the neck of an oxbow or horseshoe bend. An artificial straightening or short cut in a channel.

Dalles. The nearly vertical walls of a canyon or gorge, usually containing a rapid. (Local in Northwest.)

Danger area. The specified area above, below, or within which there may exist potential danger. *See also: Prohibited area; Restricted area.*

Danger line. (1) A line drawn on a chart to indicate the limits of safe navigation for a vessel of specific draft. (2) A line used to draw the navigator's attention to a danger, which would not stand out clearly enough if it were represented on the chart solely by the specific symbols.

Danger sounding. A minimum sounding chosen for a vessel of specific draft in a given area to indicate the limit of safe navigation.

Dangerous cargo. The term "dangerous cargo" means all explosives and other hazardous materials or cargo covered by federal regulations.

Dangerous rock. A sunken rock of a small area (pinacle), at such a depth as to be considered dangerous to surface navigation.

Dangerous wreck. A wreck submerged at such a depth as to be considered dangerous to surface navigation.

Datum, geodetic. A set of constants specifying the coordinate system used for geodetic control, i.e., for calculating coordinates of points on the earth.

Datum plane. A surface used as a reference from which heights or depths are reckoned. The plane is called a *tidal datum* when defined by a phase of the tide, for example, high water or low water.

Datum sounding. The horizontal plane or tidal datum to which the soundings on a hydrographic sur-

vey are reduced. Also called *datum for sounding reduction*.

Datum, tidal. A surface with a designated elevation from which heights or depths are reckoned, defined by a certain phase of the tide.

Datum, vertical. For marine applications, a base elevation used as a reference from which to reckon heights or depths.

Daybeacon. An unlighted fixed structure which is equipped with a daymark for daytime identification.

Deadhead. A submerged or barely awash log or tree trunk freely floating at varying attitudes in contrast to the plane formed by the still (undisturbed) surface of the water. At times, one end of a deadhead may become attached to the bottom with the opposite (unattached) end floating.

Dead reckoning. The process of determining the position of a vessel at any instant by applying to the last well-determined position (point of departure or subsequent fix) the run that has since been made. The position so obtained is called a *dead reckoning position*. When the principle purpose of dead reckoning is to lay down on the chart a reference plot for evaluating the reasonableness of positioning by other means, the dead reckoning plot is usually constructed without allowance for disturbing elements (such as current, wind, sea conditions, roughness of vessel's bottom, etc.), the course steered being used for direction and ordered speed being used for rate of movement along the course line.

Deep. A relatively small area of exceptional depth found in a depression. The term is generally restricted to depths greater than 3,000 fathoms.

Deep-draught route. A route which is primarily selected for use by ships which, because of their deep draught, may not be able to navigate safely outside such route.

Deep-water route. A route in a designated area within definite limits which has been accurately surveyed for clearance of sea bottom and submerged obstacles to a minimum indicated depth of water.

Defense Mapping Agency. The DMA (renamed National Imagery and Mapping Agency in 1995) was established as an agency of the Department of Defense (DOD) on January 1, 1972, under the provisions of the National Security Act of 1947, as amended (61 Stat. 495; 50 U.S.C. 401). The mission of the DMA is to provide mapping, charting, and geodetic support and services to the Secretary of Defense, the Joint Chiefs of Staff, the military

departments, and other DOD components through the production and worldwide distribution of maps, charts, precise positioning data, and digital data for strategic and tactical military operations and weapons systems.

Degaussing. Neutralization of the strength of the magnetic field of a vessel, by means of suitably arranged electric coils permanently installed in the vessel. *See also: Deperming.*

Degaussing range. An area for determining magnetic signatures of ships and other marine craft. Such signatures are used to determine required degaussing coil current settings and other required corrective action. Sensing instruments and cables are installed on the sea bed in the range, and there are cables leading from the range to a control position ashore. The range is usually marked by distinctive buoys.

Delta. The low alluvial land, deposited in a more or less triangular form at the mouth of a river, which is often cut by several distributaries of the main stream.

Density of soundings. Intervals between lines of sounding and soundings in the same line. Density of soundings mostly depends on the scale and nature of the survey. Also called *frequency of soundings*.

Deperming. The process of changing the magnetic condition of a vessel by wrapping a large conductor around it a number of times in a vertical plane, athwartships, and energizing the coil thus formed. If a single coil is placed horizontally around the vessel and energized, the process is called *flashing* if the coil remains stationary, and *wiping* if it is moved up and down. *See also: Degaussing.*

Depression. A general term signifying any depressed or lower area in the ocean floor; a hollow completely surrounded by higher ground and having no natural outlet for surface drainage.

Depression contour. A closed contour delimiting an area of lower elevation than the surrounding terrain. Directional ticks extend from the contour in a downhill direction.

Depth. The vertical distance from a given water level to the bottom. The charted depth is the vertical distance from the tidal datum to the bottom. The least depth in the approach or channel to an area, such as a port or anchorage, governing the maximum draft of vessels that can enter is called the *controlling depth*.

Depth contour navigation. A method of position determination by utilizing the depth contours on the nautical chart. Consists in fitting a series of observed echo soundings to the depth contours by recording a number of soundings and simultaneous log distances and plotting them on a strip of transparent paper at the scale of the chart. The line of soundings is fitted to the depth contours by moving it so that it remains parallel to the true course steered.

Depth, controlling. The least depth in the approach or channel to an area, such as a port of anchorage, governing the maximum draft of vessels that can enter.

Depth curve. A depth curve is a line connecting points of equal water depth which is sometimes significantly displaced outside of soundings, symbols, and other chart details for clarity as well as generalization. Depth curves therefore often represent an approximate location of the line of equal depth as related to the surveyed line delineated on the source.

Depth finder. An instrument for the measurement of the depth of water, particularly an echo sounder.

Derelict. Any property abandoned at sea, often of sufficient size as to constitute a menace to navigation; especially an abandoned vessel. *See also: Wreck.*

Deviation. The angle between the magnetic meridian and the axis of a compass card, expressed in degrees east or west to indicate the direction in which the northern end of the compass card is offset from magnetic north. Deviation is caused by disturbing magnetic influences in the immediate vicinity of the compass, as within the craft.

Deviation table. A table of the deviation of a magnetic compass on various headings, magnetic or compass.

Diaphone. A sound signal emitter operating on the principle of periodic release of compressed air controlled by the reciprocating motion of a piston operated by compressed air. The diaphone usually emits a powerful sound of low pitch which often concludes with a brief sound of lower pitch called the *grunt*. The emitted signal of a two-toned diaphone consists of two tones of different pitch, in which case the second tone is of lower pitch.

Diaphragm horn. A sound signal emitter comprising a resonant horn excited at its throat by impulsive emissions of compressed air regulated by an elastic diaphragm. Duplex or triplex horn units of

different pitch produce a chime signal. Also called *compressed air horn*.

Dike. A bank of earth or stone used to form a barrier, frequently and confusingly interchanged with **Levee**, definition 1. A dike restrains water within an area that is normally flooded.

Directional light. A light illuminating a sector or very narrow angle and intended to mark a direction to be followed.

Discharge. Includes, but is not limited to, any spilling, leaking, pouring, pumping, emitting, emptying, or dumping.

Discolored water. Unnatural colored areas in the sea due to the existence of shoals. Sea water having a color other than the blues and greens normally seen. Variations of the colors red, yellow, green, and brown, as well as black and white, have been reported. Discolorations may appear in patches, streaks, or large areas and may be caused by concentrations of inorganic or organic particles or plankton.

Discontinued. To remove from operating (permanently or temporarily) a previously authorized aid.

Discrepancy. Failure of an aid to maintain its position or function as prescribed in the *Light List*.

Discrepancy buoy. An easily transportable buoy used to temporarily replace an aid to navigation not watching properly.

District Commander. The officer of the U.S. Coast Guard designated by the Commandant to command a U.S. Coast Guard District.

Diurnal. Having a period or cycle of approximately one tidal day. Thus, the tide is said to be diurnal when only one high water and one low water occur during a tidal day, and the tidal current is said to be diurnal when there is a single flood and a single ebb period in the tidal day. A rotary current is diurnal if it changes its direction through all points of the compass once each tidal day.

Divide. The line of separation between drainage systems; the summit of an interfluvium. The highest summit or a pass or gap.

Dock. (1) The slip or waterway between two piers, or cut into the land for the berthing of ships. A pier is sometimes erroneously called a *dock*. Also called *slip*. See also: **Jetty; Landing; Quay; Wharf.** (2) A basin or enclosure for reception of vessels, and provided with means for controlling the water level. A wet dock is one in which water can be maintained

at various levels by closing a gate when the water is at the desired level. A dry dock is a dock providing support for a ship, and means of removing the water so that the bottom of the ship or other craft can be exposed. A dry dock consisting of an artificial basin is called a *graving dock*; one consisting of a floating structure is called a *floating dock*. (3) Used in the plural, a term used to describe area of the docks, wharves, basins, quays, etc.

Dock, floating. A form of dry dock consisting of a floating structure of one or more sections which can be partly submerged by controlled flooding to receive a vessel, then raised by pumping out the water so that the vessel's bottom can be exposed.

Dock sill. The foundation at the bottom of the entrance to a dry dock or lock against which the caisson or gates close. The depth of water controlling the use of the dock or lock is measured from the sill to the surface.

Dock, wet. A dock in which water can be maintained at any level by closing a gate when the water is at the desired level.

Dog leg. A leg which does not lead directly to the destination or way point. It is followed to comply with established procedures, avoid possible dangers or bad weather, delay time of arrival, etc.

Dolphin. A mooring post or buffer placed at the entrance of a dock, alongside a wharf or in the middle of a stream. In the first and second instances it is used as a buffer. In the third it is used as a mooring post by vessels which discharge their cargoes without going alongside a dock or wharf. Each dolphin is generally composed of a series of heavy piles contiguous to each other. They are arranged in a circle, brought together and capped over the top.

Dome. A label on a nautical chart which indicates a large, rounded, hemispherical structure rising from a building or a roof of the same shape. A prominent example is that of the Capitol of the United States in Washington, DC. Also a smoothly rounded, rock-capped mountain summit, roughly resembling the dome or cupola of a building.

Doubtful sounding. Of uncertain depth. The expression, as abbreviated, is used principally on charts to indicate a position where the depth may be less than indicated, the position not being in doubt.

Draft (or draught). The vertical distance, at any section of a vessel from the surface of the water to the bottom of the keel. When measured at or near the stem, it is referred to as *draft forward* and when

measured at or near the stern as *draft aft*. These drafts are more specifically described as displacement drafts as opposed to navigational drafts which are measured to the lowest appendage to the hull as opposed to the keel.

Drag. To tow a line or object below the surface, to determine the least depth in an area or to insure that a given area is free from navigational dangers to a certain depth. Drag and sweep have nearly the same meanings. Drag refers particularly to the location of obstructions or the determination that obstructions do not exist. Sweep may include, additionally, the removal of any obstructions located. *See also: Sweep.*

Drain. A channel; a trench; a watercourse, especially a narrow one.

Drawbridge. A bridge that can be raised, lowered, or drawn aside.

Drawing. An impression following the printing of a nautical chart of either its black or its magenta detail on matte finish transparent plastic, used in revising subsequent printings of the chart.

Dredged material. The term “dredge material” means any material excavated or dredged from navigable waters of the United States.

Dry dock. An enclosed basin into which a ship is taken for underwater cleaning and repairing. It is fitted with watertight entrance gates, which when closed permit the dock to be pumped dry. In modern dry docks the gates opening in the middle and hinged at sides having been replaced by a caisson or pontoon that fits closely into the entrance. The caisson is flooded and sunk in place, and can be pumped out, floated and warped away from the dock entrance to permit passage of vessels. Also called **Graving dock**.

Dry harbor. A small harbor which either dries at low water or has insufficient depths to keep vessels afloat during all states of the tide. Vessels using it must be prepared to take the ground on the falling tide.

Drying heights. Heights above chart sounding datum of those features which are periodically covered and exposed by the rise and fall of the tide.

Dry wash. A wash, arroyo, or coulee in the bed of which there is not water, except at infrequent intervals and for short periods.

Duck blind. For NOAA charting purposes, a duck blind is a nonfloating structure, used for conceal-

ing waterfowl hunters, usually consisting of a wooden framework covered with brush.

Dumping grounds. Although shown on nautical charts as dumping grounds in U.S. waters, the federal regulations for these areas have been revoked and their use for dumping discontinued. These areas will continue to be shown on nautical charts until such time as they are no longer considered to be a danger to navigation. *See also: Dump site, Spoil area.*

Dump site. An area established by federal regulation in which dumping of dredged and fill material and other nonbuoyant objects is allowed with the issuance of a permit. Dump sites are shown on nautical charts. *See also: Dumping grounds, Spoil area.*

Dune. A hill or ridge formed by the wind from sand or other granular material.

Ebb. Tidal current moving away from land or down a tidal stream. The opposite is **Flood**. Sometimes the terms “ebb” and “flood” are also used with reference to vertical tidal movement, but for this vertical movement the expressions falling tide and rising tide are considered preferable.

Ebb current. The tidal current associated with the decrease in the height of a tide. Ebb currents generally set seaward.

Ebb tide. The portion of the tide cycle between high water and the following low water. Also called *falling tide*.

Echo sounder. An instrument for determining the depth of water by measuring the time interval between the emission of a sonic or ultrasonic signal and the return of its echo from the bottom. Also called *echo sounding instrument* (or *apparatus*), *sonic depth finder*, or *ultrasonic depth finder*, as appropriate. *See also: Echo sounding.*

Echo sounding. A method of measuring the depth of water by determining the time required for sound waves to travel, at a known velocity, from the survey vessel to the bottom and return.

Eclipse. A phase of the characteristic of a flashing light during which the light is not exhibited.

Eddy. A current of water running contrary to the main current or moving circularly; a whirlpool.

Electronic aid to navigation. An aid to navigation using electronic equipment. If the navigational information is transmitted by radio waves, the device

may be called a *radio aid to navigation*.

Electronic navigation. Navigation by means of electronic equipment. The expression electronic navigation is more inclusive than radionavigation, since it includes navigation involving any electronic device or instrument.

Elevations. Heights of natural and artificial objects above an adopted reference plane. On NOAA nautical charts, the elevations of bare rocks, bridges, landmarks, and lights are referenced to the plane of mean high water; contour and summit elevations are referenced to mean sea level, if the source for such information is referenced to this plane.

Embankment. An artificial deposit of material that is raised above the natural surface of the land and used to contain, divert, or store water; support roads or railways; or for other similar purposes.

Embayment. Any indentation of a coast regardless of width at the entrance or depth of penetration into the land.

Entrance lock. A lock between the tideway and an enclosed basin when their water levels vary. By means of the lock, which has two sets of gates, vessels can pass either way at all states of the tide. Also called **Tide lock**. See also: **Nontidal basin**.

Escarpment. An extended line of cliffs or bluffs; a high, steep face of rock; an elongated and comparatively steep slope of the seafloor, separating flat or gently sloping areas.

Establish. To place an authorized aid in operation for the first time.

Established direction of traffic flow. A traffic flow pattern indicating the directional movement of traffic as established within a traffic separation scheme.

Estuary. An embayment of the coast in which fresh river water entering at its head mixes with the relatively saline ocean water. When tidal action is the dominant mixing agent it is usually termed a "tidal estuary." Also, the lower reaches and mouth of a river emptying directly into the sea where tidal mixing takes place. The latter is sometimes called a *river estuary*.

Everglade. A tract of swampy land covered mostly with tall grass; a swamp or inundated tract of low land. (Local in the South.)

Exclusive Economic Zone. The Exclusive Economic Zone of the United States is a zone contiguous to the territorial sea, including zones contiguous to

the territorial sea of the U.S., the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands (to the extent consistent with the Covenant and the United States Trusteeship Agreement), and United States overseas territories and possessions. The Exclusive Economic Zone extends to a distance 200 nautical miles from the baseline from which the breadth of the territorial sea is measured.

Exercise area. An area shown on charts within which naval, military, or aerial exercises are carried out. Also called *military practice area*.

Extinguished. A lighted aid which has failed to show a light signal.

Extrusion (border break). The extension of chart detail outside the neatline.

Fairway. That part of a river, harbor, etc., where the main navigable channel for vessels of larger size lies. The usual course followed by vessels entering or leaving harbor. Also called *ship channel*. The word "fairway" has been generally interpreted to include any navigable water on which vessels of commerce habitually move, and, therefore, embraces the water inside channel buoys where light-draft vessels frequently navigate and not merely the ship channel itself.

Fairway buoy. A buoy marking the fairway in a channel. They are painted in black-and-white or red-and-white vertical stripes. Also called **mid-channel buoy**.

Fall (falls). A cascade, waterfall, or cataract; the flow or descent of one body of water into another. (Usually plural.)

Fan. A gently sloping, cone-shaped accumulation of material normally located at the mouth of a canyon.

Fast land. Land inshore of the inner edge of a marsh; usually at or above the plane of mean high water.

Fast shoreline. The term "fast shoreline" refers to the line appearing on a shoreline map that separates water from fast, natural uplands. This line should not be confused with the approximate back limits of marsh or marine vegetation which is normally compiled shoreward from an apparent shoreline and in lieu of the fast shoreline.

Fathom. The common unit of depth in the ocean for countries using the English system of units, equal to 6 feet (1.83 meters). It is also sometimes used in expressing horizontal distances, in which case 120

fathoms make one cable or very nearly 1/10 nautical mile.

Fault. In geology, a break or shear in the earth's crust with an observable displacement between the two sides of the break, and parallel to the plane of the break.

Federal project depth. The design dredging depth of a channel constructed by the U.S. Army Corps of Engineers; the project depth may or may not be the goal of maintenance dredging after completion of the channel. For this reason federal project depth must not be confused with **Controlling depth**.

Ferryboat. A vessel in which passengers, vehicles, and goods are conveyed over narrow waters.

Fill material. The term "fill material" means any material used for the primary purpose of replacing an aquatic area with dry land or of changing the bottom elevation of any waterbody. The term does not include any pollutant discharged into the water primarily to dispose of waste.

Filtering. This is the process of selecting specific data within a specific source document for chart application.

Finger piers. Small piers which extend from a larger main pier.

Fiord (or fjord). A long narrow arm of the sea, running up between high banks or cliffs, as on the coast of Norway. Often has a relatively shallow sill across its entrance.

Fish aggregating devices (FADs). Clusters of submerged hollow spheres tethered to a 5-foot diameter spherical surface buoy and cabled to heavy concrete blocks on the seafloor to hold them in suspension. FADs are deployed in depths of 480 to 9,000 feet and at distances from 2 to 15 miles off shore. They are primarily used in the waters off the Hawaiian Islands and to attract fish for commercial and recreational fishermen.

Fish havens. Areas established by private interests, usually sport fishermen, to simulate natural reefs and wrecks that attract fish. The reefs are constructed by dumping assorted junk in areas which may be of very small extent or may stretch a considerable distance along a depth contour. Fish havens are outlined and labeled on charts. Also called *fishery reefs*.

Fishing ground. A water area in which fishing is frequently carried on. Also called *fishing area* or **Fishing zone**.

Fishing zone. The offshore zone in which exclusive fishing rights and management are held by the coastal nation. The United States fishing zone, known as the *Fishery Conservation Zone*, is defined under P.L. 94-265. The law states, "The inner boundary of the Fishery Conservation Zone is a line conterminous with the seaward boundary of each of the coastal states, and the outer boundary of such zone is a line drawn in such manner that each point on it is 200-nautical miles from the baseline from which the territorial sea is measured."

Fish pound. A fixed fish trap of the barrier type. Also called *weir*. It generally consists of a stone wall built across the mouth of a creek and of such height that it can be covered only at high spring tide. At one point there is an opening which can be closed, thus retaining any fish that made their way into the creek on flood tide. When the opening is closed, the water can pass through a grating in the door and when the creek is dry the fish are collected.

Fish (or fishing) stakes. Poles or stakes placed in shallow water to outline fishing grounds or to catch fish.

Fishtrap areas. Areas established by the U.S. Army Corps of Engineers in which traps may be built and maintained according to established regulations. The fish stakes which may exist in these areas are obstructions to navigation and may be dangerous. The limits of fishtrap areas and a cautionary note are usually charted.

Fix. A position determined without reference to any former position. In concept, a fix is the common intersection of two or more lines of position obtained from simultaneous observations not dependent upon any former position. In normal practice, a fix is the most probable position derived from two or more intersecting lines of position obtained from observations made at nearly the same time and advanced or retired to a common time, the lines when numbering three or more not intersecting at a common point because of the errors associated with each line.

Fixed bridge. A single- or multiple-span bridge without a movable span. It has fixed vertical and horizontal clearance.

Flagpole. A label on a nautical chart which indicates a single staff from which flags are displayed. The term is used when the pole is not attached to a building. The label *flagstaff* is used for a flagpole rising from a building.

Flag tower. A label on a nautical chart which indicates a scaffoldlike tower from which flags are dis-

played.

Flashing light. A light in which the total duration of light in a period is shorter than the total duration of darkness, and appearances of light (flashes) are usually of equal duration. The term is commonly used for a single-flashing light, a flashing light in which a flash is regularly repeated (at a rate of less than 50 flashes per minute).

Flash tube. A discharge lamp, operated with electronic equipment, giving a high light output for a very brief period, capable of repetition.

Flat. A level tract lying at a small depth below the surface of water, or alternately covered and left bare by the tide (“tidal flat,” “mud flat”).

Float. A float is a floating structure, usually rectangular in shape, which generally serves as a landing or pierhead.

Floating aid. A buoy, secured in its assigned position by a mooring.

Floating breakwater. A breakwater consisting of a series of logs or timbers chained or lashed together and secured by chains or cables attached to anchors or large blocks of stone, so as to form a protected basin for the mooring or anchoring of vessels.

Floating dock. A form of dry dock consisting of a floating structure of one or more sections, which can be partly submerged by controlled flooding to receive a vessel, then raised by pumping out the water so that the vessel's bottom can be exposed. *See also: Graving dock.*

Flood. Tidal current moving toward land or up a tidal stream. The opposite is **Ebb**.

Flood current. The movement of a tidal current toward the shore or up a tidal river or estuary.

Floodgate. A gate for shutting out, admitting, or releasing a body of water; a sluice.

Flood plain. Belt of low flat ground bordering a stream channel that is flooded when runoff exceeds the capacity of the stream channel.

Floor. The bed or bottom of the ocean. A comparatively level valley bottom; any low-lying ground surface.

Fog detector. A device used to automatically determine conditions of visibility which warrant the turning on or off of a sound signal or additional light signals.

Fog signal. Generic term for sound and wireless signals employed aboard ship and on shore stations in fog, mist, falling snow, or heavy rainstorms.

Folio charts. These NOAA charts consist of two to four sheets, are printed front and back, folded, and are bound in a protective cardboard jacket.

Foot. (1) The bottom of a slope, grade, or declivity. A term for the lower part of any elevated land form. (2) A unit of length defined to be 1/3 of a yard and equal in the United States, since 1866, to exactly 1200/3937 of a meter.

Foothill. One of the lower subsidiary hills at the foot of a mountain, or of higher hills. (Commonly used in the plural.)

Fore and aft bridge. A series of connecting gangways between the forward and after bridges or between a bridge house and forecandle deck or poop deck. It is commonly found on tankers, where such an installation is desirable due to the slippery condition of the upper deck. Sometimes called *monkey bridge*. Also called *connecting bridge*, *flying bridge*, *catwalk*.

Foreland. A cape or promontory.

Foreshore. In legal terminology, the strip of land between the high- and low-water marks that is alternately covered and uncovered by the flow of the tide. In coastal engineering work, it is defined as the part of the shore that lies between the crest of the berm and the ordinary low-water mark, which is ordinarily traversed by the uprush and backrush of the waves as the tide rises and falls; the foreshore would thus extend farther inshore than the shore. *See also: Shore.*

Foreshore (according to Coastal Engineering.) That part of the shore lying between the crest of the seaward berm (or the upper limit of wave wash at high tide) and the ordinary low-water mark. *See also: Foreshore (according to Riparian Law).*

Foreshore (according to Riparian Law). The strip of land between the high- and low-water marks that is alternately covered and uncovered by the flow of the tide. *See also: Foreshore (according to Coastal Engineering).*

Fork. One of the major bifurcations of a stream; a branch.

Form line. Broken lines resembling contour lines but representing no actual elevations, which have been sketched from visual observation or from inadequate or unreliable map sources, to show collectively the

shape of the terrain rather than the elevation.

Foul area. An area of numerous uncharted dangers to navigation. The area charted serves as a warning to the mariner that all dangers are not charted individually and that navigation through the area may be hazardous. The term “foul” is not applied to a soft continuum with indefinite boundaries, such as mud or sand; to areas congested with marine vegetation, such as kelp or grass in water; or to materials not likely to cause damage to a vessel.

Foul bottom. A hard, uneven, rocky, or obstructed bottom having poor holding qualities for anchors, or one having rocks or wreckage that would endanger an anchored vessel.

Foul ground. An area unsuitable for anchoring, taking the ground, or ground fishing due to being strewn with rocks, boulders, coral, or obstructions.

Fractional scale. The scale expressed as a fraction (termed the “representative fraction” or “R.F.” of the chart or map) in which the numerator is unity and the denominator is the number that the unit distance must be multiplied by in order to obtain its distance on the ground in the same units, thus 1/12,000. Also used in the form 1:12,000 and 1-12,000. Sometimes referred to as natural scale. *See also: Scale.*

Fracture zone. A zone of unusually irregular topography of the seafloor averaging 60-nautical miles in width and normally greater than 1,000-nautical miles in length. This zone is characterized by large seamounts, steep-sided, or nonsymmetrical ridges, troughs, or escarpments.

Fringing reef. A reef closely attached to a shore, as contrasted with a barrier reef, which is separated from the shore by a lagoon.

Gap. A deep notch, ravine, or opening between hills or in a ridge or mountain chain; a steep-sided depression cutting transversely across a ridge or rise.

General charts. These NOAA charts of the coast are published at scales from 1:150,000 to 1:600,000, and are intended for coastal navigation when a course is well offshore but can be fixed by landmarks, lights, buoys, and characteristic soundings.

Generalization. Selection and simplified representation of detail appropriate to the scale and/or the purpose of a map.

Generalization of detail. A term used to indicate that the least essential information is not shown on a chart. The purpose of generalization is primarily

to avoid over crowding charts where space is very limited. It also serves to reduce the correctional maintenance needed and to induce navigators, at least of deeper draft vessels, to use charts of larger scales.

Geodesy. (1) The science concerned with determining the size and shape of the earth. (2) The science that locates positions on the earth and determines the earth’s gravity field. The definition can be extended to other planetary bodies. (3) The branch of surveys in which the curvature of the earth must be taken into account when determining directions and distances.

Geodetic coordinates. The quantities of latitude, longitude, and height (ellipsoid), which define the position of a point on the surface of the earth with respect to the reference spheroid. Also imprecisely called *geographic coordinates*.

Geodetic datum. (Also called *horizontal* or *geodetic datum*.) The adopted position in latitude and longitude of a single point to which the charted features of a vast region are referred.

Geodetic latitude. The angle which the normal at a point on the reference spheroid makes with the plane of the geodetic equator.

Geodetic longitude. The angle between the plane of the geodetic meridian and the plane of an initial meridian, arbitrarily chosen.

Geodetic position. A position of a point on the surface of the earth expressed in terms of geodetic latitude and geodetic longitude. A geodetic position implies an adopted geodetic datum.

Geographic. Signifying basic relationship to the earth considered as a globe-shaped body. The term geographic is applied alike to data based on the geoid and on a spheroid. In geodetic surveys in this country, coordinated data consisting of latitudes, longitudes, azimuths, and lengths of lines, are recorded and published under the general title of geographic positions.

Geographic and other names. The term “geographic names” refers to localities, natural features, and artificial waterways. The names do not apply to other artificial objects or features such as roads, bridges, parks, buildings, and stadiums.

Geographical coordinates. Spherical coordinates defining a point on the surface of the earth, usually latitude and longitude. Also called *terrestrial coordinates*.

Geographic latitude. A general term applying alike to astronomic and geodetic latitudes.

Geographic longitude. A general term applying alike to astronomic and geodetic longitudes.

Geographic meridian. A general term applying alike to astronomic and geodetic meridians.

Geographic position. The position of a point on the surface of the earth expressed in terms of latitude and longitude, either geodetic or astronomic.

Geographic range. The greatest distance the curvature of the earth permits an object of a given height to be seen from a particular height of eye without regard to luminous intensity or visibility conditions.

Geyser. A spring which throws forth intermittent jets of heated water or steam.

Glacial drift. Sand, clay, or boulders transported by glaciers to their present locations.

Glacial gorge. A deeply cut valley in U-shaped cross-section, resulting from glacial erosion.

Glacial lake. A lake, the basin of which has been carved by glacial action; also a body of water held in place by the damming action of a glacier.

Glacier. A mass of snow and ice continuously moving from higher to lower ground or, if afloat, continuously spreading. The principal forms of glaciers are ice sheets, ice shelves, ice caps, ice piedmonts, and various types of mountain glaciers.

Glen. A secluded and small narrow valley; a dell, dale, or vale.

Gnomonic chart. A chart constructed on the gnomonic projection and often used as an adjunct for transferring a great circle to a Mercator chart. Commonly called *Great-Circle Chart*.

Gorge. A canyon, a rugged and deep ravine or gulch.

Grade. A slope of uniform inclination.

Gradient. Any departure from the horizontal; a grade; a slope; a part of a road or railroad which slopes upward or downward; frequently used in connection with the slope of streams.

Gradient tints. Tinted areas on a map or chart, normally in the form of bands following the contour pattern, used to indicate ranges of altitude.

Graphic scale (also called linear scale). A line or bar on a map or chart subdivided to represent distances on the earth in various units, e.g., nauti-

cal miles, statute miles, yards, feet, kilometers, etc.

Grass in water. For mapping purposes, is a nonwoody stemmed vascular plant (which may or may not be a true grass), that is attached to the bottom below the sounding datum. Grass in water is normally mapped only when the vegetation grows to the water surface.

Gravel. One of several descriptors of the "nature of the seabed" used in Chart No. 1. *See under: Stones.*

Graving dock. A form of dry dock consisting of an artificial basin fitted with a gate or caisson, into which vessels can be floated and the water pumped out to expose the vessels' bottoms. The term is derived from the term used to describe the process of burning barnacles and other accretions from a ship's bottom. *See also: Floating dock.*

Great circle. The line of intersection of the surface of a sphere and any plane which passes through the center of the sphere.

Great circle course. The direction of the great circle through the point of departure and the destination, expressed as the angular distance from a reference direction, usually north, to the direction of the great circle. The angle varies from point to point along the great circle.

Greenwich Meridian. The meridian of the Royal Observatory, Greenwich, England. Adopted in 1884 by a conference of nations as the initial, or zero, of longitudes for all nations.

Gridiron. A gridiron or careening grid is a flat frame, usually of parallel timber baulks, erected on the foreshore so that a vessel may dry out on it for painting or repair at low water.

Groin. A structure projecting from shore and designed to break the current and reduce erosion and fill out the shore by a deposition of new materials. Groins may be classified as permeable or impermeable: impermeable groins have solid or nearly solid structure, permeable groins have openings through them of sufficient size to permit passage of appreciable quantities of littoral drift.

Grotto. A small, picturesque cave, vault, or cavern.

Ground. To touch bottom or run aground. In a serious grounding the vessel is said to *strand*.

Group repetition interval. Of a particular LORAN-C chain, the specified time interval for all stations of the chain to transmit their pulse groups. For each chain a minimum *group repetition interval* (GRI) is selected of sufficient duration to pro-

vide time for each station to transmit its pulse group and additional time between each pulse group so that signals from two or more stations cannot overlap in time anywhere within the coverage area.

Group repetition interval code. The group repetition interval in microseconds divided by ten.

Gulch. A small ravine; a small, shallow canyon with smoothly inclined slopes and steep sides.

Gulf. A tract of water within an indentation or curve of the coastline, in size between a bay and a sea—the Gulf of California, for example.

Gully. Small valley cut into soft sediments on the continental shelf or continental slope. A small channel recently cut by running water; smaller than a gulch or ravine.

Gut. A narrow passage or contracted strait connecting two bodies of water.

Hachures. (1) Short lines on topographic maps or nautical charts to indicate the slope of the ground or the submarine bottom. They usually follow the direction of the slope. (2) Inward-pointing short lines or “ticks” around the circumference of a closed contour indicating a depression or a minimum.

Half-tide level. The level midway between mean high water and mean low water. It may differ slightly from mean sea level. Also called *mean tide level*.

Hammock. Variation of hummock, but usually characterized more by soil type and vegetation than by elevation. (Southern U.S., especially Florida and gulf coast.)

Harbor. A water area nearly surrounded by land or artificial dikes forming a safe anchorage for ships.

Harbor charts. NOAA charts published at scales of 1:50,000 and larger, and intended for navigating in harbors and smaller waterways and for anchorage.

Harbor line. The line beyond which wharves and other structures cannot be extended.

Harbormaster. A local official who has charge of mooring and berthing of vessels, collecting harbor fees, and other duties.

Harbor of refuge. A harbor provided as a temporary refuge on a stormy coast for the convenience of passing ships. Also called *port of refuge*. It may or may not be part of a shipping port.

Harbor reach. The reach of a winding river or estuary which leads directly to the harbor.

Hatching. The drawing or engraving of fine, parallel

or crossed lines to show shading.

Head. A precipitous cape, or promontory. *See also: Headland.*

Heading. The horizontal direction in which a ship actually points or heads at any instant, expressed in angular units from a reference direction, usually from 000° at the reference direction clockwise through 360°.

Headland. In common usage, a land mass having a considerable elevation. In the context of the law of the sea, elevation is not an important attribute and a headland may be the apex of a salient of the coast, the point of maximum extension of a portion of the land into the water, or a point on the shore at which there is an appreciable change in direction of the general trend of the coast.

Heath. A tract of wasteland; peat bog, usually covered by a low shrubby growth, but may have scattered small open water holes. (Local in eastern Maine.)

Height. The vertical distance of an object, point, or level above the ground or other established reference plane.

Height of tide. The vertical distance from the chart datum to the level of the water at any time.

Highland(s). High or elevated land; a lofty headland or cliff. The mountainous or elevated part of any country, occasionally also in the names of geographical districts.

Hill. A natural elevation of the earth’s surface, smaller than a mountain. *See also: Knoll.*

Hillock. A small hill.

Holding ground. An expression usually used with a modifying adjective to indicate the quality of the holding power of the material constituting the bottom of an anchorage, e.g., of good (or poor) holding ground.

Hole. A small bay, as Woods Hole, Massachusetts. (Local in New England.)

Hollow. A small ravine; a low tract of land encompassed by hills or mountains.

Hook. Something resembling a hook in shape, particularly: (a) a spit or narrow cape of sand or gravel, which turns landward at the outer end; or (b) a sharp bend or curve, as in the stream.

Hulk. The hull or portion of the hull of a derelict vessel, usually without superstructure or other appur-

tenance. A major portion of the hulk is usually visible at some stage of tide.

Hummock. A rounded elevation of ground, of limited size, rising out of a level surface (often swamp), frequently densely wooded.

Hydrographer. One who studies and practices the science of hydrography.

Hydrographic survey. A survey made in relation to any considerable body of water, such as a bay, harbor, lake, or river for the purposes of determination of channel depths for navigation, location of rocks, sand bars, lights, and buoys; and in the case of rivers, made for flood control, power development, navigation, water supply, and water storage.

Hydrography. (1) The science which deals with the measurements and description of the physical features of the oceans, seas, lakes, rivers, and their adjoining coastal areas, with particular reference to their use for navigational purposes. (2) That part of topography pertaining to water and drainage features.

Hyperbolic line of position. A line of position in the shape of a hyperbola, determined by measuring the difference in distance to two fixed points, e.g., LORAN-C lines of position.

IALA Maritime Buoyage System. As designed by the International Association of Lighthouse Authorities, a new uniform system of maritime buoyage, which is expected to be implemented by most maritime nations. However, within the single system are two international buoyage regions, designated as region A and region B, where lateral marks differ only in the colors of port and starboard hand marks. In region A, red is to port on entering; in region B, red is to starboard on entering. The system may be briefly described as a combined cardinal and lateral system. The system applies to all fixed and floating marks, other than lighthouses, sector lights, leading lights and marks, lightships and large navigational buoys. The system provides five types of marks which may be used in combination: lateral marks, used in conjunction with a conventional direction of buoyage, are generally used for well-defined channels. Where a channel divides, a modified lateral mark may be used to indicate the preferred route. Lateral marks may differ between buoyage regions A and B. Cardinal marks used in conjunction with the mariner's compass, indicate where the mariner may find navigable water. Isolated danger marks indicate isolated dangers of limited size that have navigable water all around them.

Safe water marks to indicate that there is navigable water around their position, e.g., mid-channel marks. Special marks, not primarily intended to assist navigation, indicate an area or feature referred to in nautical documents.

Ice buoy. A lighted or unlighted buoy of sturdy construction that replaces a buoy more easily damaged during the winter ice season.

Improved channels. Dredged channels under the jurisdiction of the U.S. Army Corps of Engineers, and maintained to provide an assigned controlling depth. Symbolized on the nautical charts by black, dashed lines to represent the side limits, with the controlling depth and date of ascertainment given together with a tabulation for more detailed information.

Index contour line. A contour line accentuated by a heavier line weight to distinguish it from intermediate contours. Index contours are usually shown as every fifth contour with their assigned values, to facilitate reading elevations.

Inland rules of the road. Rules to be followed by all vessels while navigating upon certain inland waters of the United States.

Inland sea. A body of water nearly or completely surrounded by land, especially if very large or composed of salt water. If completely surrounded by land, it is usually called a *lake*. This should not be confused with closed sea, that part of the ocean enclosed by headlands, within narrow straits, etc., or within the territorial jurisdiction of a country.

Inlet. A narrow waterway or a gap in the land, which connects a small body of water with a larger body; a small narrow bay or creek. A narrow body of water extending into the land from a larger body of water. A long, narrow inlet with gradually decreasing depth inward is called a *ria*. Also called *arm*, *tongue*.

Inner harbor. The part of a harbor more remote from the sea, as contrasted with the outer harbor. These expressions are usually used only in a harbor that is clearly divided into two parts, as by a narrow passageway or artificial structures. The inner harbor generally has additional protection and is often the principal berthing area.

Inoperative. Sound signal or radionavigation aid out of service due to a malfunction.

Inset. In cartography (1) a small area outside the neatlines of map or chart included within the

neatlines or borders to avoid publishing a separate graphic of the small area alone; (2) a representation of a small area on a larger scale (e.g., town-plan inset), or of a large area at a smaller scale (e.g., orientation inset); (3) any information, not normally appearing within the geographic limits of a map, which has been enclosed by border lines and included within the map neatlines. Insets are always placed in areas where important features will not be covered.

Inshore. The zone of variable width between the shoreface and the seaward limit of the breaker zone.

Intermediate contour line. A contour line drawn between index contours. Depending on the contour interval, there are three or four intermediate contours between the index contours.

Intermittent stream. A stream or portion of a stream that flows only in direct response to precipitation. It receives little or no water from springs and no long-continued supply from melting snow or other sources. It is dry for a large part of the year, ordinarily more than 3 months.

International Great Lakes Datum (IGLD) (1955). Mean water level at Pointe-au-Père, Quebec, Canada, on the Gulf of St. Lawrence, over the period 1941 through 1956, from which dynamic elevations throughout the Great Lakes region are measured. The term is often used to mean the entire system of dynamic elevations rather than just the reference water level.

International Hydrographic Bureau (IHB). An organization founded in 1921 for the purpose of establishing a close and permanent association among hydrographic offices of its states members. The Bureau's main object is to encourage coordination of hydrographic work with a view to rendering navigation easier and safer throughout the world. A convention agreed by member states became effective in 1970 making the IHB the executive organ of the *International Hydrographic Organization* (IHO).

International Hydrographic Organization (IHO). Organized in 1970 by ratification of the Convention on the International Hydrographic Organization, IHO legally assumed the international intergovernmental responsibilities formerly held by the *International Hydrographic Bureau* (IHB), which now serves as the administrative or headquarters facility for IHO. IHB was founded in 1921.

International Maritime Organization (IMO). (Formerly the *Inter-governmental Maritime Con-*

sultative Organization (IMCO).) Established in 1959 (as the UN-sponsored international agency for the promotion of maritime safety and marine pollution prevention), IMO is mainly concerned with maritime safety and coordinates work relating to atomic propulsion, aviation, health, labor, meteorology, oceanography, and telecommunications.

International rules. The rules of the road established by agreement between maritime nations, governing the navigation of the high seas.

International rules of the road. The rules of navigation that are applicable to the water areas seaward of the lines established by the U.S. Coast Guard.

Interrupted quick-flashing light. A quick light in which the sequence of flashes is interrupted by regularly repeated eclipses of constant and long duration.

Intracoastal waterway. An inside protected route extending through New Jersey; from Norfolk, VA, to Key West, FL; across Florida, from St. Lucie Inlet to Fort Myers, Charlotte Harbor, Tampa Bay, and Tarpon Springs; and from Carabelle, FL, to Brownsville, TX.

Island. A land area (smaller than a continent) extending above and completely surrounded by water at mean high water; an area of dry land entirely surrounded by water or a swamp; an area of swamp entirely surrounded by open water.

Island shelf. A zone adjacent to an island and extending from the low-water line to a depth at which there is a marked increase of slope to greater depth.

Island slope. A declivity from the outer edge of an island shelf into greater depths.

Islet. A small island.

Isogonic. A line connecting points of equal magnetic variation. Also called *isogonic line*, *isogonal*.

Isogonic chart. A chart showing magnetic variation with isogonic lines and the annual rate of change in variation with isoporic lines.

Isoporic line. A line connecting points of equal annual rate of change of any magnetic element. Also called *isopor*.

Isthmus. A narrow strip of land connecting two larger bodies of land.

Jetty. A structure built out into the water to restrain or direct currents, usually to protect a river mouth or harbor entrance from silting. On open seacoasts,

a structure extending into a body of water, and designed to prevent shoaling of a channel by littoral materials, and to direct and confine the stream or tidal flow. Jetties are built at the mouth of a river or tidal inlet to help deepen and stabilize a channel.

Junction. (1) A place of joining of two channels, as that of tributary with a main river. (2) In levelling, the place where two or more lines of levels are connected together. (3) In hydrographic survey, the joining of two adjacent survey sheets.

Junction buoy. A buoy which, when viewed from a vessel approaching from the open sea or in the same direction as the main stream of flood current, or in the direction established by appropriate authority, indicates the place at which two channels meet. *See also: Bifurcation buoy.*

Kelp. One of an order of unusually large, blade-shaped, or vinelike brown algae. Kelp is so frequently associated with rocky bottoms, and therefore possible dangers to navigation, that it should not be confused with, or compiled as, other marine vegetation. Kelp of one species or another is widely found in the cold oceans of the world.

Key. A low island or reef; a cay.

Kill. A channel, creek, or stream, as the kills between Staten Island, NY, and Bergen Neck, NJ.

Knob. A rounded hill or mountain, especially an isolated one.

Knoll. A small round hill; a mound; a seamount rising less than 500 fathoms from the seafloor and having a pointed or rounded top.

Knot. A unit of speed defined as *1 international nautical mile per hour*.

Lagoon. (1) A shallow sound, pond, or lake generally separated from the open sea. (2) A body of water enclosed by the reefs and islands of an atoll.

Lake. (1) A standing body of open water that occurs in a natural depression fed by one or more streams from which a stream may flow, that occurs due to the widening or natural blockage or cutoff of a river or stream, or that occurs in an isolated natural depression that is not a part of a surface river or stream. (2) A standing body of open water created by artificially blocking or restricting the flow of a river, stream, or tidal area. (3) Any standing body of inland water, generally of considerable size. There are exceptions such as the lakes in Louisiana, which are open to or connect with the Gulf of Mexico. Occasionally a lake is called a sea, especially if very large and composed of salt water.

Landfall. The first sighting of land when approached from seaward. By extension, the term is sometimes used to refer to the first contact with land by other means, e.g., by radar.

Landing. A place where boats receive or discharge passengers, freight, etc. *See also: Wharf.*

Landmark. In marine terminology, a landmark is an object or feature of known position that is conspicuous to the mariner and so located that it can be used for navigation. A landmark should be readily identifiable by the mariner and located where it will be visible through a useful range of travel. An object that is conspicuous at one point, but quickly becomes lost in background clutter or hidden from view by obstructions as the mariner progresses is of limited value.

Landslide. Earth and rock which becomes loosened from a hillside by moisture or snow, and slides or falls down the slope.

Lane. An established route as an air lane or shipping lane. In an electronic radiolocation lattice, the zone between two lines on which measured values, expressed in terms of the system's electronic unit (wavelength or microsecond), are whole numbers and are one unit apart.

Large navigational buoy (LNB or LANBY). (1) A large buoy designed to take the place of a lightship where construction of an offshore light station is not feasible. These 40-foot diameter buoys may show secondary lights from heights of about 36 feet above the water. In addition to the light, these buoys may mount a radiobeacon and provide sound signals. A station buoy may be moored nearby. Called *light-house buoy* in British terminology. (2) A 40-foot diameter, automated discus-shaped buoy used to replace light vessels.

Lateral system. (1) A system of aids to navigation in which buoys, daybeacons, and minor lights are assigned colors and shapes in accordance with their respective location in relation to safe water. (2) A system of aids to navigation in which the shape, color, and number distinction are assigned in accordance with their location in respect to navigable waters. When used to mark a channel, they are assigned colors to indicate the side they mark and numbers to indicate their sequence along the channel. The lateral system is used in the United States. In the cardinal system, the aids are assigned shape, color, and number distinction in accordance with location relative to the nearest obstruction.

Latitude. Angular distance from a primary great

circle or plane. *Terrestrial latitude* is angular distance from the equator, measured northward or southward through 90° and labeled “N” or “S” to indicate the distance between the plumb line and the plane of the celestial equator. *Geodetic* or *topographical latitude* at a station is angular distance between the plane of the geodetic equator and a normal to the ellipsoid. *Geocentric latitude* is the angle at the center of the reference ellipsoid between the celestial equator and a radius vector to a point on the ellipsoid. Geodetic and sometimes *astronomical latitude* are also called *geographic latitude*. Geodetic latitude is used for charts.

Latitude scale. The subdivided east and west borders of a Mercator chart into degrees and minutes; a variant of the graphic scale, since a minute of latitude is very nearly equal to a nautical mile.

Lava. The fluid or semifluid matter flowing from a volcano. The substance that results from the cooling of the molten rock. Part of the ocean bed is composed of lava.

Lead. The weight attached to a line. A *sounding lead* is used for determining depth of water. A *hand lead* is a light sounding (7 lbs to 14 lbs), usually having a line of not more than 25 fathoms. A *deep-sea lead* is a heavy sounding lead (about 30 lbs to 100 lbs), usually having a line 100 fathoms or more in length. A *light deep-sea lead* (30 lbs to 50 lbs), used for sounding depths of 20 to 60 fathoms is called a *coasting lead*. A type of sounding lead used without removal from the water between soundings is called a *fish lead*. A *drift lead* is one placed on the bottom to indicate movement of a vessel. To *heave the lead* is to take a sounding with a lead.

Leadline. A line, graduated with attached marks and fastened to a sounding lead, used for determining the depth of water when making soundings by hand. The leadline is usually used in depths of less than 25 fathoms. Also called *sounding line*.

Leading light. A light so located that vessels may steer directly for it until close aboard, when a new course is taken.

Ledge. (1) A rocky formation connected with and fringing the shore and generally uncovered at the sounding datum. (2) A rocky formation continuous with and fringing the shore. The area that uncovers is usually represented on charts by symbols.

Left bank. That bank of a stream or river on the left of an observer facing in the direction of flow, or downstream. *See also: Right bank.*

Leg. (1) Each straight section of a traverse. (2) One part of a craft's track consisting of a single course line.

Legend. (1) A description, explanation, table of symbols, and other information printed on a map or chart to provide a better understanding and interpretation of it. The title of a map or chart formerly was considered part of the legend, but this usage is obsolete. (2) An artificial bank confining a stream channel or limiting adjacent areas subject to flooding. (3) On the seafloor, an embankment bordering a canyon, valley, or sea channel.

Levee. (1) An artificial bank confining a stream channel or limiting adjacent areas subject to flooding. (2) On the seafloor, an embankment bordering a canyon, valley, or seachannel.

Light. The signal emitted by a lighted aid to navigation; a piece of illuminating apparatus; a lighted aid to navigation on a fixed structure.

Lighthouse. A building on some conspicuous point of the coast, a pier or jetty, an island or rock, from which a light is exhibited at night as an aid to navigation. All maritime nations have government departments responsible for the establishment and maintenance of lighthouses.

Light List. (1) A publication giving detailed information regarding lighted navigational aids and fog signals. The name and location of the lighted aids, their characteristics, heights, range, structure description, and other pertinent remarks are given. (2) *Light List*, published by the U.S. Coast Guard in five volumes, covers the waters of the United States and its possessions including the Intracoastal Waterway, the Great Lakes (both U.S. and certain aids on the Canadian shores), and the Mississippi River and its navigable tributaries. In addition to the information on lighted aids, the *Light List* gives information on unlighted buoys, radiobeacons, radio direction finder calibration stations, daybeacons, RACONs, etc. (3) *List of Lights*, published by the *NIMA* in seven volumes, covers waters other than the United States and its possessions. In addition to the information on lighted aids, the *List of Lists* provides information on storm signals, signal stations, radio direction finder stations, radiobeacons, etc.

Light List Number (LLNR). The number used to identify a navigational light in the *Light List*. This number should not be confused with “International Number,” which is an identifying number assigned by the *International Hydrographic Organization*. The international number is in *italic* type and is

located under the *Light List* number in the *Light List*. Sometimes called *list of lights number*.

Light sector. (1) As defined by bearings from seaward, the sector in which a navigational light is visible or in which it has a distinctive color different from that of adjoining sectors, or in which it is obscured. (2) The arc over which a light is visible described in degrees true as observed from a vessel toward the light.

Lightship. A distinctively marked vessel providing aids to navigation services similar to a light station, i.e., a light of high intensity and reliability, sound signal, and radiobeacon, and moored at a station where erection of a fixed structure is not feasible. The chart symbol represents the approximate location of the anchor. Also called *light vessel*. Lightships are no longer used in the United States.

Light station. A manned station providing a light usually of high intensity and reliability. It may also provide sound signal and radiobeacon services. In many instances, sound signals, radiobeacon equipment, and operating personnel are housed in separate buildings near the light structure.

Line feature. A cartographic feature with the geometry of a line, i.e., defined by a sequence of connected points. Represented on a map by a line of certain width or type, e.g., dashed, dotted, double, a sequence of symbols.

Line of soundings. A series of soundings obtained by a vessel underway, usually at regular intervals. In piloting, this information may be used to determine an estimated position, by recording the soundings at appropriate intervals (to the scale of the chart) along a line drawn on transparent paper or plastic, to represent the track, and then fitting the plot to the chart, by trial and error. A vessel obtaining soundings along a course line, for use in making or improving a chart, is said to run a line of soundings.

Littoral. Pertaining to the shore, especially of the sea; a coastal region. Used coextensively with "riparian." *See also: Riparian lands.*

Littoral current. A current in the littoral zone such as a longshore or rip current.

Littoral state. One that borders on the sea or Great Lakes. Corresponds to Riparian State, which borders on a river. *See also: Riparian lands.*

Littoral zone. In coastal engineering, the area from

the shoreline to just beyond the breaker zone. In biological oceanography, it is that part of the benthic division extending from the high-water line out to a depth of about 200 meters. The littoral system is divided into a eulittoral and sublittoral zone, separated at a depth of about 50 meters. Also, frequently used interchangeably with "intertidal zone."

Local magnetic disturbance. An anomaly of the magnetic field of the earth, extending over a relatively small area, due to local magnetic influences. Also called: *local attraction, magnetic anomaly.*

Lock. A basin in a waterway with caissons or gates at each end by means of which vessels are passed from one water level to another without materially affecting the higher level. To lock a vessel means to pass a vessel through a lock.

Local Notice to Mariners (LNM). (1) A written document providing information pertaining to the condition of aids of navigation and the waterways within each U.S. Coast Guard District that is of interest to the mariner. (2) A notice issued by each U.S. Coast Guard District to disseminate important information affecting navigational safety within the District. The *Local Notice to Mariners* reports changes to and deficiencies in aids to navigation maintained by and under the authority of the U.S. Coast Guard. Other information includes channel depths, new charts, naval operations, regattas, etc. Since temporary information, known or expected to be of short duration, is not included in the weekly *Notice to Mariners* published by National Imagery and Mapping Agency, the appropriate *Local Notice to Mariners* may be the only source of such information. Much of the information contained in the *Local Notice to Mariners* is included in the weekly *Notice to Mariners*. The *Local Notice to Mariners* is published as often as required; usually weekly. It may be obtained by making application to the appropriate U.S. Coast Guard District Commander.

Log booms. Heavy logs chained or lashed together and moored or anchored so as to enclose and contain rafted logs.

Longitude. Angular distance, along a primary great circle, from the adopted reference point; the angle between a reference plane through the polar axis and a second plane through that axis. *Terrestrial longitude* is the arc of a parallel, or the angle at the pole, between the prime meridian and the meridian of a point on the earth, measured eastward or westward from the Prime meridian through 180°, and labeled "E" or "W" to indicate the direction of measurement. *Astronomical longitude* is the angle be-

tween the plane of the prime meridian and the plane of the celestial meridian at a station and the plane of the geodetic meridian at Greenwich. *Geodetic* and sometimes *astronomical longitude* are also called *geographic longitude*. *Geodetic longitude* is used in charting.

Longshore bar. A bar running roughly parallel to the shoreline.

Lookout station. A distinctive structure or place on shore from which personnel keep watch upon events at sea or along the coast.

Lookout tower. Any tower surmounted by a small house in which a watch is habitually kept, as distinguished from an observation tower in which no watch is kept.

Loran. (1) The designation of a family of electronic navigational systems by which hyperbolic lines of position are determined by measuring the differences in the time of reception of synchronized pulse signals from two fixed transmitters. The name "LORAN" is derived from the words **Long Range Navigation**. (2) A long-range, low-frequency (90 to 110 kHz) radionavigation system by which a hyperbolic line of position of high accuracy is obtained by measuring the difference in the times of arrival of pulse signals radiated by a pair of synchronized transmitters (master station and secondary station), which are separated by several hundred miles.

Lower lowwater datum (LLWD). An approximation of mean lower low water that has been adopted as a standard reference for a limited area and is retained for an indefinite period regardless of the fact that it may differ slightly from a better determination of mean lower low water from a subsequent series of observations. Used primarily for river and harbor engineering purposes. Columbia River lower low water datum is an example.

Lowland. Low and relatively level land at a lower elevation than adjoining districts.

Low-water datum (LWD). The dynamic elevation for each of the Great Lakes and Lake St. Clair and the corresponding sloping surfaces of the St. Marys, St. Clair, Detroit, Niagara, and St. Lawrence Rivers to which are referred the depths shown on the navigational charts and the authorized depths for navigation improvement projects.

Low-water line. The line where the established low-water datum intersects the shore. The plane of reference that constitutes the low-water datum differs in different regions.

Loxodrome. A curve, on the surface of a sphere, intersecting all great circles of the sphere at a constant oblique angle, theoretically never reaching the pole while closely approaching it.

Luminous range. The greatest distance a light can be seen given its nominal range (luminous intensity) and the existing meteorological visibility.

Magnetic annual change. The amount of magnetic secular change undergone in 1 year. Also called *annual change*, *annual magnetic change*, *annual rate*, *annual rate of change*.

Magnetic disturbance. An irregular, large-amplitude, rapid change of the earth's magnetic field, which occurs at approximately the same time worldwide. A magnetic disturbance is usually associated with the occurrence of solar flares or other strong solar activity. Also called a *magnetic storm*. Sometimes, the daily magnetic variation is called a *magnetic disturbance*.

Magnetic meridian. The line having the direction of the magnetic needle at a given place; a vertical plane fixed by the direction taken by a perfect compass needle.

Magnetic north. The direction indicated by the north-seeking pole of a freely suspended magnetic needle, influenced only by the earth's magnetic field.

Magnetic variation. A regular or irregular change, with time, of magnetic declination, dip, or intensity. In nautical and aeronautical navigation, and sometimes in surveying, the term *magnetic variation* is used for magnetic declination. The regular magnetic variations are: *secular*, the change from year to year in the same direction (which usually persists for many decades); *annual*, the change over a period of 1 year; and *diurnal*, the change over a period of 1 day (24 hours). Irregular variations, when sudden, worldwide, and severe, are known as *magnetic storms*.

Mainland. The principal portion of a large land area. The term is used loosely to contrast a principal land mass from outlying islands and sometimes peninsulas.

Major aid to navigation. An aid of considerable intensity, reliability, and range exhibited from fixed structures or marine sites. Major aids are classified as primary or secondary and are usually manned or remotely monitored.

Major light. A light of high intensity and reliability exhibited from a fixed structure or on a marine site

(except range light). Major lights include primary seacoast lights and secondary lights. *See also: Minor light.*

Mangrove. This type includes the mangroves and stands of tree like plants that are predominantly mangrove. These plants are perennials that frequently create an apparent shoreline. Much of this vegetation grows in the vicinity of the high waterline with overhanging and tangled growth that obscures the shoreline from the mariner.

Manmade (artificial) shoreline. This is the line of contact between the surface of a body of water and artificial land or features provided the artificial waterline is continuous with the natural shoreline. This is intended to include as artificial shoreline the water along breakwaters, bulkheads, fill areas, jetties, and other features built out from the land.

Map. A representation, usually on a plane surface, of all or part of the surface of the earth, celestial sphere, or other area; showing relative size and position, according to a given projection, of the physical features represented and such other information as may be applicable to the purpose intended. Such a representation intended primarily for navigational use is called a *chart*. A method of representing all or part of the surface of a sphere or spheroid, such as the earth, upon a plane surface is called a *map projection*. A *planimetric map* indicates only the horizontal positions of features; a *topographic map* indicates both horizontal and vertical position. A topographic map showing relief by means of contour lines drawn at regular height intervals is called a *contour map*. A *relief map* emphasizes relative elevations or relief; a three-dimensional relief map is called a *relief model*. The pattern on the underside of extensive cloud areas, created by the varying amounts of light reflected from the earth's surface, is called a *sky map*. A chart which shows the distribution of meteorological conditions over an area at a given moment may be called a *weather map*.

Map bathymetric. Map delineating the form of the bottom of a body of water, or a portion thereof, by the use of depth contours (isobaths).

Map digitization. Conversion of map data from graphic to digital form.

Map editing. The process of checking a map or chart, in its various stages of preparation, to ensure accuracy, completeness, correct preparation, and interpretation of sources used, and legible and precise reproduction.

Map, isogonic. A map showing lines of constant

magnetic inclination for a particular base data (shown on the map). Lines of equal annual change in declination are generally also shown. If the map is designed for use in navigation, it is called an *isogonic chart*.

Map, planimetric. A map which shows only the horizontal positions of the features represented. Unlike a topographic map, a planimetric map does not show relief in measurable form. Natural features usually shown include rivers, lakes, and seas; mountains, valleys, and plains; forests, prairies, marshes, and deserts. Cultural features shown include cities, farms, transportation routes, and public utility facilities; and political and private boundary lines.

Map projection. An orderly system of lines on a plane representing a corresponding system of imaginary lines on an adopted terrestrial or celestial datum surface. Also the mathematical concept of such a system.

Map projection, Mercator. A conformal map projection of the so-called cylindrical type. The equator is represented by a straight line true to scale; the geographic meridians are represented by parallel straight lines perpendicular to the line representing the equator; they are spaced according to their distance apart at the equator. The geographic parallels are represented by a second system of straight lines perpendicular to the family of lines representing the meridians, and therefore, parallel with the equator. Conformality is achieved by mathematical analysis, the spacing of the parallels being increased with increasing distance from the equator to conform with the expanding scale along the parallels resulting from the meridians being represented by parallel lines. The Mercator map projection is considered one of the most valuable of all map projections, its most useful feature being that a line of constant bearing (azimuth) on a sphere is represented on the projection by a straight line.

Map relief. A map whose surface is shaped to represent topography in a region. The most common kind is the plastic relief map. This is made by printing an ordinary topographic map on a plastic sheet, which is then placed on a plaster mold that has been carved to represent the topography. Heat and pressure are applied to fix the plastic sheet permanently into the shape of the mold. Another kind, less common and more costly but showing more detail in greater accuracy, is the solid relief-map, made by carving the topography, etc., in a suitable substance, such as plaster, and then painting or

drawing further detail on the model. Also called a *terrain model* or *relief model*.

Map scale, equivalent. An equivalent scale is the relationship which a small distance on the map bears to the corresponding distance on the earth, expressed as an equivalence. Usually, but not necessarily, the equivalence is expressed in different specified units; for example, 1 inch (on the map) equals 1 mile (on the ground).

Map scale, fractional. A fractional scale is the ratio which any small distance on the map bears to the corresponding distance on the earth. It may be written in the form of a fraction: 1/10,000; or as a proportion 1:10,000.

Map scale, graphic (or bar). A line on a map subdivided and marked with the distance which each of its parts represents on the earth.

Map, topographic. (1) A map showing the horizontal and vertical locations of natural and artificial features. It is distinguished from a planimetric map by the presence of quantitative symbols showing the relief. A topographic map usually shows the same features as a planimetric map, but uses numbered contour lines or comparable symbols to indicate elevations of mountains, valleys, and plains; in the case of hydrographic charts, symbols and numbers are used to show depths in bodies of water. (2) A map whose principal purpose is to portray and identify the natural or artificial features of the earth's surface as faithfully as possible within the limitations imposed by scale.

Margin data. All explanatory information given in the margin of a map or chart which clarifies, defines, illustrates, and/or supplements the graphic portion of the sheet. Also called *border data*, *border information*, *margin information*.

Marginal sea. The water area bordering a nation over which has exclusive jurisdiction, except for the right of innocent passage of foreign vessels. It is a creation of international law, although no agreement has thus far been reached by the international community regarding its width. It extends seaward from the low-water mark along a straight coast and from the seaward limits of inland waters where there are embayments. The United States has traditionally claimed 3 nautical miles as its width and has not recognized the claims of other countries to a wider belt. Also called *territorial sea*, *adjacent sea*, *marine belt*, *maritime belt*, and *3-mile limit*.

Marginal wharf. A wharf flush with the general

adjacent shoreline and normally of concrete or asphalt decking atop open-pile supports. This is the predominant type of modern general cargo wharf.

Marina. A harbor facility for small boats, yachts, etc., where supplies, repairs, and various services are available.

Marine. An adjective meaning relating to navigation or shipping; relating to or connected with the sea; used, or adopted for use at sea. Sometimes called *maritime*, but maritime more frequently applies to that which borders on the sea.

Marine railway. A marine railway is a track, cradle, and winding mechanism for hauling vessels out of the water so that the hull can be exposed as in a dry dock. This is also called a *patent slip* in British terminology.

Marine vegetation. For NOAA charting purposes, marine vegetation refers to permanent or semipermanent vegetation or areas of vegetation growing at or seaward from the shoreline and presenting some significance to the mariner.

Marker. (1) A small automatic radiobeacon with a range of 4 to 6 miles located on a buoy, pierhead, or piling structure. It is not intended for long-range accurate bearings but serves as a local mark indicating a channel entrance, turning point, pierhead, etc., in or near a harbor. The use of two or more beacons provides a "fix." (2) That which marks something; a marker beacon. *See also: Radiobeacon.* (3) A term used to describe an aid intended as a guide for normal surface navigation. It is generally used to refer to any private unlighted or lighted fixed aid to navigation not established or maintained by the U.S. Coast Guard and not listed in the *Light List*, which is erected to make minor channels. The term may also refer to markers for other specific purposes (e.g., measured mile markers or dredging range).

Marker buoy. A temporary buoy used in surveying to make a location of particular interest, such as a shoal or reef. *See also: Station buoy.*

Marl. One of several descriptors of the "nature of the seabed" used in Chart No. 1. A crumbling, earthy deposit, particularly one of clay mixed with sand, lime, decomposed shells, etc. Sometimes a layer of marl becomes quite compact. Part of the ocean bed is composed of marl. Marl is generally not a suitable holding material for anchors. Anchoring in marl requires an anchor with a pointed bill to penetrate the bottom.

Marsh. (1) An area of wet, often spongy ground that is subject to frequent flooding or tidal inundations, but not considered to be continually underwater. It is characterized by the growth of nonwoody stemmed, vascular plants, such as the bulrushes, cordgrasses, reeds, and other wetland species, and by the lack of trees. Marsh often forms a transition between the open water and the dry uplands and is frequently associated with an apparent shoreline. (2) A tract of low, wet ground, usually miry and covered with rank vegetation. It may, at times, be sufficiently dry to permit tillage or haycutting, but requires drainage to make it permanently arable.

Matching. The act by which detail or information on the edge, or overlap area, of a map or chart is compared, adjusted, and corrected to agree with the existing overlapping chart.

Mattress. A mass of interwoven brush, poles, etc., used to protect a bank from erosion.

Mean higher high water (MHHW). A tidal datum. The average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch. For stations with shorter series, simultaneous observational comparisons are made with a control tide station in order to derive the equivalent datum of the National Tidal Datum Epoch.

Mean high water (MHW). A tidal datum. The average of all the high-water heights observed over the National Tidal Datum Epoch. For stations with shorter series, simultaneous observational comparisons are made with a control tide station in order to derive the equivalent datum of the National Tidal Datum Epoch.

Mean high water line (MHWL). The line on a chart or map, which represents the intersection of the land with the water surface at the elevation of mean high water. *See also:* **Shoreline.**

Mean lower low water (MLLW). A tidal datum. The average of the lower low-water height of each tidal day observed over the National Tidal Datum Epoch. For stations with shorter series, simultaneous observational comparisons are made with a control tide station in order to derive the equivalent datum of the National Tidal Datum Epoch.

Mean low water (MLW). A tidal datum. The average of all the low-water heights observed over the National Tidal Datum Epoch. For stations with shorter series, simultaneous observational comparisons are made with a control tide station in order to

derive the equivalent datum of the National Tidal Datum Epoch.

Mean low water line (MLWL). The line on a chart or map which represents the intersection of the land with the water surface at the elevation of mean low water.

Mean range of tide. The difference in height between mean high water and mean low water.

Mean sea level (MSL). (1) A tidal datum. The arithmetic mean of hourly heights observed over the National Tidal Datum Epoch. Shorter series are specified in the name; e.g., monthly mean sea level and yearly mean sea level. (2) The average height of the surface of the sea for all stages of the tide over a 19-year period, usually determined from hourly height readings. A determination of mean sea level that has been adopted as a standard for heights is called a *sea level datum*.

Measured mile. A length of 1-nautical mile, the limits of which have been accurately measured and are indicated by ranges ashore. It is used by vessels to calibrate logs, engine revolution counters, etc., and to determine speed.

Mercator projection. A conformal map projection upon a plane, in which the latitude and longitude lines are straight parallel lines intersecting each other at right angles, and in which the meridians of longitude are spaced equally throughout the map, based on their distance apart at the equator, and the distances between parallels are derived by a mathematical analysis, their spacing bearing an exact relationship to the spreading of the meridians along a corresponding parallel.

Meridian. A north-south reference line, particularly a great circle through the geographical poles of the earth. The term usually refers to the upper branch, the half, from pole to pole, which passes through a given place; the other half being called the lower branch.

Meridians. Imaginary planes passing through the poles and measure longitudes east or west of the principal meridian of Greenwich. *See also:* **Longitude.**

Mesa. A flat-topped, rocky hill with steep sides. (Southwestern United States.)

Meter. The base unit of length in the International System of Units, equal to 39.37008 inches, approximately.

Metonic cycle. A period of almost 19 years or 235

lunations. Devised by Meton, an Athenian astronomer who lived in the fifth century B.C., for the purpose of obtaining a period in which new and full moon would recur on the same day of the year.

Metric system. Decimal system of weights and measures based on the meter as a unit length and the kilogram as a unit mass.

Microwave. A very short electromagnetic wave, usually considered to be about 30 centimeters to 1 millimeter in length. While the limits are not clearly defined, it is generally considered as the wavelength of a radar operation.

Microwave tower. A tower which carries microwave broadcasters and receivers used in the transmission of communications signals.

Mid-channel buoy. See **Fairway buoy.**

Middle latitude. Half the arithmetical sum of the latitudes of two places on the same side of the equator.

Mile. (1) A unit of distance. The nautical mile, or sea mile, is used primarily in navigation. Nearly all maritime nations have adopted the International Nautical Mile of 1,852 meters proposed in 1929 by the International Hydrographic Bureau. The U.S. Departments of Defense and Commerce adopted this value on July 1, 1954. Using the yard-meter conversion factor effective July 1, 1959 (1 yard = 0.9144 meter, exactly), the International Nautical Mile is equivalent to 6076.11549 feet, approximately. The geographical mile is the length of one minute of arc of the equator, considered to be 6,087.08 feet. The statute mile or land mile (5,280 feet in the United States) is commonly used for navigation on rivers and lakes, notably in the Great Lakes of North America. (2) A unit of distance, variously defined. See also: **Mile, nautical; Mile, statute.**

Mile, international nautical. The nautical mile defined as exactly 1,852 meters length. It was proposed in 1929 by the International Hydrographic Bureau because of the variety of nautical miles then in use. It has since been adopted by most maritime nations, and, on July 1, 1954, by the U.S. Department of Commerce and the U.S. Department of Defense.

Mile, nautical. The U.S. nautical mile is defined as equal to the length of 1/60 of a degree of a great circle on a sphere having an area equal to the area of an ellipsoid representing the earth's surface. Its value, calculated for the Clarke spheroid of 1866, is

1,853.248 m (6,080.2 feet); (compare with the international nautical mile of 1,852 m (6,076.1 feet)). The U.S. nautical mile is also called a *sea mile*, a *geographical mile*, and a *geographic mile*. It may be taken as equal to the length of a minute of arc along the equator or a minute of latitude anywhere on a map. The nautical mile is used principally for stating distances over water. It is the unit of length used for defining the **knot**, a unit of speed defined as 1-nautical mile per hour.

Mile, statute. A unit of length defined to be exactly 5,280 feet. It is used principally in stating distances on land.

Minor aid to navigation. An unmanned, unmonitored light on a fixed structure showing usually low to moderate intensity; generally fitted with light characteristics and dayboards in accordance with its lateral significance in the waterway.

Minor light. An automatic unmanned light on a fixed structure usually showing low to moderate intensity. Minor lights are established in harbors, along channels, along rivers, and in isolated locations. See also: **Major light.**

Moat. An annual depression that may not be continuous, located at the base of a seamount or an island.

Mobile hoist. A device for hauling out small craft and moving them over land to cradles or to the place at which their hulls and underwater appendages are cleaned, painted, or repaired. It consists of a self-powered steel frame on rubber tires, with two slings suspended from electric hoists. The lift is run out onto a trackway extending over the water, the slings are lowered beneath the water, and the boat is positioned over the slings; the hoists then raise the slings (and the boat) above the trackway and ground, and the lift backs off the trackway.

Mole. A form of breakwater alongside which vessels may lie on the sheltered side only; in some cases it may lie entirely within an artificial harbor, permitting vessels to lie along both sides. A structure, usually massive, on the seaward side of a harbor for its protection against current and wave action, drift ice, sanding up, wind, etc. Sometimes it may be suitable for the berthing of ships. See also: **Jetty; Quay.**

Mooring. A place where a vessel may be secured. (Usually in pl.) The equipment used to secure a vessel. The process of securing a vessel, other than anchoring with a single anchor.

Mooring buoy. A buoy secured to the bottom by per-

manent moorings and provided with means for mooring a vessel by use of its anchor chain or mooring lines.

Morse code light. A light in which the appearances of light of two clearly different durations are grouped to represent a character or characters in the Morse code.

Moraine. Any accumulation of loose material deposited by a glacier.

Mound. A low hill of earth, natural or artificial; in general, any prominent, more or less isolated hill.

Mount. A large hill or mountain, usually a detached, characteristically conical mass of earth.

Mountain. A natural elevation of the earth's surface rising more or less abruptly from the surrounding level, and attaining an altitude which, relatively to adjacent elevations, is impressive or notable.

Mountain range. A series of connected and aligned mountains or mountain ridges.

Mouth. The place of discharge of a stream into the ocean or entrance to a bay from the ocean.

Mud. One of several descriptors of the "nature of the seabed" used in Chart No. 1. A general term applied to mixtures of sediments in water. Where the grains are less than 0.002 mm in diameter, the mixture is called *clay*. Where the grains are between 0.002 mm and 0.0625 mm in diameter the mixture is called *silt*.

Muskeg. A bog or marsh. (Local in north central United States, Canada, and Alaska.)

Narrows. A navigable narrow part of a bay, strait, river, etc.

National boundary. The seaward boundary of the United States within which it exercises exclusive sovereignty except for the right of innocent passage of foreign vessels; the three-mile limit. *See: Marginal sea.*

National Oceanic and Atmospheric Administration (NOAA). NOAA was formed on October 3, 1970, by Reorganization Plan 4 of 1970. Its principal functions are authorized by Title 15, Chapter 9, United States Code (National Weather Service); Title 33, Chapter 17, United States Code (National Ocean Survey); and Title 16, Chapter 9, United States Code (National Marine Fisheries Service). NOAA's mission was further defined by the Coastal Zone Management Act of 1972, the Marine Mammals Protection Act of 1972, the Marine Protection, Research,

and Sanctuaries Act of 1972, the Weather Modification Reporting Act of 1972, the Endangered Species Act of 1973, the Offshore Shrimp Fisheries Act of 1973, and the Fishery Conservation and Management Act of 1976. The mission of NOAA is to explore, map, and chart the global ocean and its living resources, to manage, use, and conserve those resources and to describe, monitor, and predict conditions in the atmosphere, ocean, sun and space environment, issue warnings against impending destructive natural events, develop beneficial methods of environmental modification, and assess the consequences of inadvertent environmental modification over several scales of time.

Natural harbor. A harbor possessing natural shelter in a large degree. Natural harbors require only the provision of such facilities as quays or piers and sometimes deepening by artificial means to make them serviceable as shipping ports.

Natural shoreline. This is the line of contact between the surface of a body of water and natural land, including islands. It does not include the water line along floating or artificial features, or along rocks smaller than those considered to be islands.

Nautical. Of or pertaining to ships, navigation (chiefly marine), or seamen. In contrast, *navigational* refers to navigation only, *marine* refers to the sea, *maritime* indicates relationship or proximity to the sea, and *naval* refers to the Navy.

Nautical chart. A representation of a portion of the navigable waters of the earth and adjacent coastal areas on a specified map projection, and designed specifically to meet requirements of marine navigation. Included on most nautical charts are: depths of water, characteristics of the bottom, elevations of selected topographic features, general configuration and characteristics of the coast, the shoreline (usually the mean high water line), dangers, obstructions, aids to navigation, limited tidal data, and information about magnetic variation in the charted area.

Nautical Chart Manual. A manual, published by NOAA, for the cartographer engaged in the construction and revision of nautical charts.

Navigability. The actual navigable capacity of a waterway and not the extent of tidal influence.

Navigable. Affording passage to a craft; capable of being navigated.

Navigable waters of the United States. Navigable waters of the United States are those waters that

are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity. See 33 CFR Part 329 for a more complete definition of this term.

Navigation. The process of planning, recording, and controlling the movement of a craft or vehicle from one place to another. The word “navigate” is from the Latin *navigatus*, the past participle of the verb *navigere*, which is derived from the word *navis*, meaning “ship,” and *agere*, meaning “to move,” or “to direct.”

Navigational aid. An instrument, device, chart, method, etc., intended to assist in the navigation of a craft. This expression should not be confused with *aids to navigation*, which refers only to devices external to a craft. In British usage, the terms *navigational aid* and *aid to navigation* are used without distinction.

Navigation, coastwise. Navigation in the vicinity of a coast, in contrast with offshore navigation.

Navigation, electronic. Navigation by means of electronic equipment. The expression *electronic navigation* is more inclusive than radio navigation, since it includes navigation involving any electronic device or instrument.

Navigation, offshore. Navigation at distance from a coast, in contrast with coastwise navigation.

Navigation, radio. Any method of navigation in which location or velocity is inferred from measurements on radio waves. The term is generally applied only to one of the following methods of navigation: (a) measuring direction or distance to two or more radio transmitters, (b) measuring differences of distance to two or more pairs of radio transmitters, (c) measuring the Doppler shift in frequency of a signal from an orbiting beacon or beacons.

Navigation system. A set of equipment and techniques by which the location of a moving vehicle, vessel, or aircraft can be determined and made known sufficiently quickly so the information can be used for navigation.

Navigation system, hyperbolic. A navigation system using the differences in distance (measured in wavelengths) of a mobile unit from three or more fixed stations to determine location. The locus of

points all of which have the same difference of distance is a “hyperbola.” If the difference in distance from two pairs of fixed points (one point of which may be common to the two) is determined, two intersecting hyperbolas result and the mobile unit is located at one of those intersections.

Neatline. Line, usually grid or graticule, bounding the detail of a map. Also referred to as “inner neatline” to differentiate from border drawn outside of neatline.

Neck. (1) A narrow isthmus, cape, or promontory. (2) The land areas between streams flowing into a sound or bay. (3) A narrow strip of land, which connects a peninsula with the mainland. (4) A narrow body of water between two larger bodies; a strait.

Net under keel clearance. The distance between the ocean bottom and the portion of a tanker’s hull closest to the ocean bottom when the tanker is underway, moored, or anchored, considering ship motion in responding to the combination of actual wind, wave, tide, and current conditions.

New chart. A new chart is usually constructed to satisfy the needs of navigation in a particular area; e.g., the area had no prior adequate chart coverage of the same scale, or limits are radically changed. The new chart may cancel an existing chart.

New editions. A chart issue that cancels a previous issue. If the new information renders that existing chart obsolete, the new printing is designated a new edition. A new edition reflects one or more changes of such importance to navigation that all previous printings are obsolete. Changes may be based on corrections from the *Notice to Mariners* (NM), in addition to other sources. The date of a new edition is the date of the latest *NIMA* NM from which the chart has been corrected. The edition number and date are printed in the lower left corner of the chart.

Nineteen-Year Tidal Cycle. The period of time generally reckoned as constituting a full tidal cycle because the more important of the periodic tidal variations due to astronomic causes will have passed through complete cycles. The longest cycle to which the tide is subject is due to a slow change in the declination of the moon, which covers 18.6 years.

Nominal range. The maximum distance a light may be seen in clear weather (meteorological visibility of 10-nautical miles) without regard to the curvature of the earth, height of eye, or height of light. Listed for all federal lighted aids except range lights and directional lights.

Nontidal basin. An enclosed basin separated from tidal waters by a caisson or flood gates. Ships are moved into the dock near high tide. The dock is closed when the tide begins to fall. If necessary, ships are kept afloat by pumping water into the dock to maintain the desired level. Also called *wet dock*.

Nontidal waters. Waters not subject to tidal influence.

Normal pool elevation. The level at which a controlled body of water is generally maintained.

North. The primary reference direction relative to the earth; the direction indicated by 000° in any system other than relative. True north is the direction of the north geographic pole; magnetic north the direction north as determined by the earth's magnetic compass; grid north an arbitrary reference direction used with grid navigation.

Notch. A short defile through a hill, ridge, or mountain. A deep, close pass; a defile; gap. (Local in New England.)

Notice to Mariners (NM). A weekly publication of the *National Imagery and Mapping Agency (NIMA)* prepared jointly with NOAA and the U.S. Coast Guard giving information on changes in aids to navigation (lights, buoys, daymarks, ranges), dangers to navigation (rocks, shoals, reefs, wrecks), selected items from the *Local Notice to Mariners*, important new soundings, changes in channels, harbor construction, radionavigation information, new and revised charts and publications, special warnings and notices, pertinent Hydrolant, Hydropac, Navarea IV and XII messages and in general, all such information as affects the mariner's charts, manuals, catalogs, sailing directions (pilots), etc. The *Notice to Mariners* should be used routinely for updating the latest editions of nautical charts and related publications.

Nun buoy. An unlighted buoy of which the upper part of the body (above the water line), or the larger part of the superstructure, has approximately the shape of a cone with vertex upwards. Called *conical buoy* in British terminology.

Obscured. Said of the arc of a light sector designated by its limiting bearings in which the light is not visible from seaward.

Obsolete chart. A chart which is not considered safe to use for navigation because it does not contain the latest important navigational information.

Obstruction. Anything that hinders or prevents movement, particularly anything that endangers or prevents passage of a vessel or aircraft. The term is usually used to refer to an isolated danger to navigation, such as a submerged rock or pinnacle in the case of marine navigation, and a tower, tall building, mountain peak, etc., in the case of air navigation.

Obstruction buoy. A buoy used alone to indicate a dangerous reef or shoal. The buoy may be passed on either side.

Obstruction light. A light indicating a radio tower or other obstruction to aircraft.

Obstruction mark. A navigation mark used alone to indicate a dangerous reef or shoal. The mark may be passed on either hand.

Occasional light. A light put into service only on demand.

Ocean. The great body of salt water, which occupies two-thirds of the surface of the earth, or one of its major subdivisions. The sea as opposed to the land.

Offshore. Away from the shore. The comparatively flat zone of variable width which extends from the outermark of the rather steeply sloping shoreface to the edge of the continental shelf.

Offshore light stations. Manned light stations built on exposed marine sites to replace lightships.

Offshore navigation. Navigation at a distance from a coast, in contrast with coastwise navigation in the vicinity of a coast.

Offshore tower. Manned or monitored light stations built on exposed marine sites to replace light vessels.

Offshore water. Water adjacent to land in which the physical properties are slightly influenced by continental conditions.

Off soundings. Said of a vessel navigating beyond the 100-fathom curve. In earlier times, said of a vessel in water deeper than could be sounded with the sounding lead.

Off station. A floating aid not on its assigned position.

Omega Navigation System. A worldwide, continuous, radionavigation system of medium accuracy, which provides hyperbolic lines of position through phase comparisons of VLF (10 kHz to 14 kHz) continuous wave signals transmitted on a common fre-

- quency on a time-shared basis. The system is comprised of eight transmitting stations.
- Omnirange.** A radio aid to navigation providing direct indication of a magnetic bearing (omnibearing) of that station from any direction. Also called *omnidirectional range* or *omnidirectional beacon*.
- One-way traffic lane.** A lane within which all ships are advised to proceed in approximately the same direction.
- On soundings.** Said of a vessel navigating within the 100-fathom curve. In earlier times, said of a vessel in water sufficiently shallow for sounding by sounding lead.
- Ooze.** One of several descriptors of the “nature of the seabed” used in Chart No. 1. A soft, slimy, organic sediment covering part of the ocean bottom composed principally of shells or other hard parts of minute organisms. Generally, ooze offers poor purchase for anchors.
- Open coast.** The coast that fringes the marginal sea as distinguished from the coast that fringes inland water. A coast that is not sheltered from the sea.
- Open harbor.** An unsheltered harbor exposed to the sea.
- Open sea.** The water area of the open coast seaward of the ordinary low-water mark, or seaward of inland water.
- Outer Continental Shelf (OCS).** Means all submerged lands lying seaward and outside of the area of “lands beneath navigable waters” as defined in Section 2(a) of the Submerged Lands Act (43 U.S.C. 1301(a)) and of which the subsoil and seabed appertain to the United States and are subject to its jurisdiction and control. “OCS activity” means any offshore activity associated with exploration for, or development or production of, the minerals of the OCS.
- Outer Continental Shelf (OCS) Facility.** “OCS facility” means any artificial island, installation, or other device permanently or temporarily attached to the subsoil or seabed of the OCS, erected for the purpose of exploring for, developing, or producing resources therefrom, or any such installation or other device (other than a ship or vessel) for the purpose of transporting such resources. The term includes mobile offshore drilling units when in contact with the seabed of the OCS for exploration or exploitation of subsea resources.
- Outlet.** The opening by or through which any body of water discharges its content.
- Overfalls.** Short, breaking waves, occurring when a strong current passes over a shoal or other submarine obstruction or meets a contrary current or wind. *See: Rips.*
- Palisade.** A picturesque, extended rock cliff rising steeply from the margin of a stream or lake; a line of bold cliffs, especially one showing basaltic columns (usually plural).
- Parallels.** Imaginary planes passing through the earth parallel to the equator and measure latitudes north or south of the equator.
- Pass.** (1) A navigable channel leading to a harbor or river. Sometimes called **Passage**. (2) A break in a mountain range, permitting earlier passage from one side of the range to the other; also called *Col*. (3) A narrow opening through a barrier reef, atoll, or sand bar.
- Passage.** A narrow navigable channel, especially one through reefs or islands. Sometimes called a **pass**, or in New England waters, a *hole*.
- Passing light.** A term applies to a lower candlepower light mounted on a light structure. Used where a mariner passes out of the main light beam (such as a range light) but still needs to keep the structure in sight during transit.
- Peak.** A pointed mountain summit; the topmost point; summit; a seamount rising more than 500 fathoms from the seafloor, and having a pointed or rounded top.
- Pebble.** One of several descriptors of the “nature of the seabed” used in Chart No. 1. *See under: Stones.*
- Pecked line.** In cartography, a symbol consisting of a line broken at regular intervals.
- Peninsula.** A body of land jutting into and nearly surrounded by water, frequently (but not necessarily) connected to a larger body of land by a neck or isthmus.
- Perch.** A staff placed on top of a buoy, rock, or shoal as a mark for navigators. A ball or cage is sometimes placed at the top of the perch, as an identifying mark.
- Period.** The interval of time between the commencement of the identical aspect in two successive cycles of a rhythmic light.
- Permafrost.** A layer of soil or bedrock at a variable depth beneath the surface of the earth in which the temperature has been below freezing continuously from a few to several thousands of years.

Photogrammetry. (1) The science or art of obtaining reliable measurements from photographic images. (2) The science of preparing charts and maps from aerial photographs using stereoscopic equipment and methods.

Pictorial symbol. A symbol whose form is a simplified portrayal of the feature or phenomenon it represents.

Pier. (1) A structure extending into the water approximately perpendicular to a shore or a bank and providing berthing for ships, and which may also provide cargo-handling facilities. *See also: Wharf.* (2) A structure extending into the water approximately perpendicular to a shore or bank and providing a promenade or place for other use, as a fishing pier. (3) A support for the spans of a bridge.

Pierhead. That part of a pier or jetty projecting farthest into the water.

Pile. A long, heavy timber or section of steel, concrete, etc., forced into the earth to serve as a support, as for a pier, or to resist lateral pressure.

Pile, sheet. A pile with a generally slender flat cross-section to be driven into the ground or seabed and meshed or interlocked with like members to form a diaphragm, wall, or bulkhead.

Piling. A group of piles set in a row.

Pillar buoy. A buoy composed of a tall central structure mounted on a broad flat base. Also called *beacon buoy*.

Pilot. One who directs the movements of a vessel through pilot waters; usually, one who has demonstrated extensive knowledge of channels, aids to navigation, dangers to navigation, etc., in a particular area and is licensed for that area.

Pilot area. A pilot area represents a meeting or boarding place where vessels pick up or disembark pilots. A pilot vessel may either cruise in the area continuously or come out on request.

Pilot station. The office or headquarters of pilots; the place where the services of a pilot may be obtained.

Pinnacle. On the seafloor, a high tower or spire-shaped pillar of rock or coral, along or cresting a summit. It may or may not be a hazard to surface navigation. Due to the sheer rise from the seafloor, no warning is given by sounding.

Pipe. A hollow metal tube, of varying diameters and

lengths, imbedded in the bottom in a manner similar to a pile. Pipes are often used as privately maintained aids to navigation and in the determination of beach or bottom sand migration (deposition or erosion).

Plain. A region of uniform general slope, comparatively level, of considerable extent, and not broken by marked elevations and depressions (it may be an extensive valley floor or a plateau summit); and extent of level or nearly level land; a flat, gently sloping or nearly level region of the seafloor.

Plan position indicator (PPI). A cathode ray scope on which signals appear in correct relation to each other, so that the scope face presents a maplike representation of the area about the transmitter, the director of a target being represented by the direction of its echo from a center and range by its distance from that center.

Plateau. An elevated plain, tableland, or flat-topped region of considerable extent; a comparatively flat-topped elevation of the seafloor greater than 60-nautical miles across the summit and normally rising more than 100 fathoms on all sides.

Platform. (1) In geographical literature, a natural or artificial terrace; a flat elevated piece of ground; a tableland, a plateau. (2) In oceanographic terminology, any artificial structure (aircraft, ship, buoy, or tower) from or on which oceanographic instruments are suspended or installed. (3) Structures which are erected on or over the seabed and subsoil of the Outer Continental Shelf and in the waters under the jurisdiction of the United States, for the purpose of exploring for, developing, removing, and transporting resources there from. This includes all fixed structures, temporary or permanent, for which a U.S Army Corps of Engineers' permit is issued. It includes, but is not necessarily limited to, all drilling platforms, production platforms, quarters platforms, pipeline riser platforms, manifold platforms, loading platforms, boat landings, caissons, oil well protective structures, tank battery barges submerged on station, drilling barges submerged on location, breakwater barges submerged on location, and all other piles, pile clusters, pipes, or structures erected in the waters.

Pocosin. A swamp; a dismal. (Southern U.S.)

Point. The extreme end of a cape, or the outer end of any land area protruding into the water (less prominent than a cape).

Polyconic map projection. A map projection having the central geographic meridian represented by

a straight line, along which the spacing for lines representing the geographic parallels is proportional to the distances between the parallels; the parallels are represented by arcs of circles which are not concentric, but whose centers lie on the line representing the central meridian, and whose radii are determined by the lengths of the elements of cones, which are tangent along the parallels. All meridians except the central ones are curved.

Pond. A small body of still water of artificial formation, its bed being either hollowed out of the soil or formed by embanking and damming up a natural hollow. A small fresh-water lake.

Pontoon. A flat-bottomed boat, or a number of flat-bottomed boats, or other floating objects, such as hollow cylinders, used as supports for a bridge.

Pontoon bridge. A bridge supported on pontoons.

Pool. A water hole or small pond; a small body of standing water; a small and rather deep body of (usually) fresh water, as one in a stream.

Port. A place for the loading and unloading of vessels recognized and supervised for maritime purposes by the public authorities. The term includes a city or borough for the reception of mariners and merchants and therefore denotes something more than a harbor or hare. A port may possess a harbor, but a harbor is not necessarily a port. Any natural creek or inlet on the seashore with adequate depth of water and sufficient shelter for ships fulfills the essential conditions of a harbor. To make it a port, in the accepted sense of the word, there must be in addition accommodation and facilities for landing passengers and goods and some amount of overseas trade.

Port hand buoy. A buoy which is to be left to the port hand when approaching from the open sea or in general proceeding in the direction of the main stream of flood current, or in the direction established by appropriate authority.

Position. A point defined by stated or implied coordinates, particularly one on the surface of the earth. A fix is a relatively accurate position determined without reference to any former position. A running fix is a position determined by crossing lines of position obtained at different times and advanced or retired to a common time. An estimated position is determined from incomplete data or data of questionable accuracy. A dead reckoning position is determined by advancing a previous position for courses and distances. A most probable position is that position of a craft judged to be most accurate

when an element of doubt exists as to the true position. It may be a fix, running fix, estimated position, or dead reckoning position depending upon the information which it is based. An assumed position is a point at which a craft is assumed to be located. A geographical position is that point on the earth at which a given celestial body is in the zenith at a specified time, or any position defined by means of its geographical coordinates. A geodetic position is a point on the earth the coordinates of which have been determined by triangulation from an accurately known initial station or one defined in terms of geodetic latitude and longitude. An astronomical position is a point on the earth whose coordinates have been determined as a result of observation of celestial bodies, or one defined in terms of astronomical latitude and longitude. A maritime position is the location of a seaport or other point along a coast. A relative position is one defined with reference to another position, either fixed or moving.

Position approximate. Of inexact position. The expression is used principally on charts to indicate that the position of a wreck, shoal, etc., has not been accurately determined or does not remain fixed. Usually shown by the abbreviation 'PA'.

Position doubtful. Of uncertain position. The expression is used principally on charts to indicate that a wreck, shoal, etc., has been reported in various positions and not definitely determined in any. Usually shown by the abbreviation 'PD'.

Position, estimated. The most probable position of a craft determined from incomplete data or data of questionable accuracy. Such a position might be determined by applying a correction to the dead reckoning position.

Positioning system, hyperbolic. A positioning system in which the observer measures the difference in time of reception of signals from two stations whose coordinates are known. The difference in time is converted to a difference in distance. The locus of all points lying at a fixed difference in distance from two points are the two branches of a hyperbola.

Positioning system, inertial. A positioning system consisting of a computer and an assemblage of three accelerometers and two or three gyroscopes. The gyroscopes are fastened together in such a way that they define the orientation of the accelerometers with respect to nonrotating coordinates and the accelerometers measure the components of acceleration of the positioning system along the direc-

tions defined by the gyroscopes. The computer and associated equipment integrate the components of acceleration to give the three components of displacement of the positioning system.

Positioning system, radio. A positioning system in which the travel time or phase shift of radio waves is measured. The most common radio positioning systems at present measure the difference in time of travel of radio pulses from three or more known points.

Positioning system, satellite. A positioning system consisting of a radio receiver, or receiver and transmitter, at the point whose location is to be determined, one or more beacons or transponders in orbit about the earth, and a computing system for determining and predicting the orbits. The satellites can be considered points of known location. The radio receiver may measure times of travel of radio pulses, directions to the satellites or the Doppler shift in the frequency of the radio waves emitted by the satellites.

Post. A small beacon, more substantial than a perch, used for marking channels. *See also: Pile.*

Potable water. Water suitable for drinking or cooking, from both health and aesthetics considerations.

Potable water intake (PWI). A structure designed for the intake of drinking water. The intake is usually elevated above the bottom, supported and protected by a debris-screening structure (crib), a separately charted feature.

Pound net. A set net composed of vertical netting supported and held in place by stakes. It consists of three essential parts. The pot (pound, pocket, bowl), the wings or hearts and the leader or lead. The pound consists of a bag of stout netting with 1-inch meshes the margin of which is supported by upright stakes. The bottom of the pound is spread and secured by ropes which pass through loops near the lower end of the stakes. The wings or heart are vertical fences of netting diverging from the entrance of the net. The mesh is 1/2-inch and they are supported by stakes. The leader, which may vary in length from about 150 feet to 1,000 or more, extends from shore or shallow water into deeper water and deflects the fish toward the heart or wings.

Prairie. A treeless and grassy plain; an extensive tract of grassland; a low, sandy, grassy tract in the Florida pine woods.

Pratique. Permission granted by the quarantine authorities (U.S. Public Health Service) to a vessel,

which has arrived from a foreign port, to communicate with the shore; pratique is normally granted only after inspection and release. Pratique may be granted by radio without inspection to some of the larger passenger vessels entering certain specified U.S. ports; a request for such radio pratique must be made by radio, giving all particulars regarding sanitary conditions aboard, from 12 to 24 hours before the time of arrival at the port.

Precautionary area. A routing measure comprising an area within defined limits where ships must navigate with particular caution and within which the direction of traffic flow may be recommended.

Precipice. The brink or edge of a high and very steep cliff; an abrupt declivity.

Preliminary chart. A chart for which there is a strong requirement, but of a region where some or all of the survey data do not meet modern standards. The deficiencies in surveys may be due to small-scale, outmoded, or nonstandard survey techniques, obsolete age, unprocessed or unapproved data, or other factors which cause the survey data to be below customary standards for the scale of the chart.

Primary light. A major aid to navigation established for the purpose of making landfalls and coastwise passages from headland to headland or for marking areas dangerous to mariners.

Prime meridian. The meridian of longitude 0°, used as the origin for measurement of longitude. The meridian of Greenwich, England, is almost universally used for this purpose.

Private aids to navigation. In U.S. waters, those aids to navigation not established and maintained by the U.S. Coast Guard. Private aids include those established by other federal agencies with prior U.S. Coast Guard approval, those aids to navigation on marine structures or other works which the owners are legally obligated to establish, maintain, and operate as prescribed by the U.S. Coast Guard, and those aids which are merely desired, for one reason or another, by the individual corporation, state or local government, or other body that has established the aid with U.S. Coast Guard approval. Although private aids to navigation are inspected periodically by the U.S. Coast Guard, the mariner should exercise special caution when using them for general navigation.

Prohibited area. An area shown on nautical charts within which navigation and/or anchoring is prohibited except as authorized by appropriate author-

ity. *See also:* **Danger area, Restricted area.**

Projection. (1) The lines representing the parallels of latitude and meridians of longitude drawn on a survey sheet, map, or chart. (2) The representation of a figure on a surface, either plane or curved, according to a definite plan. In a perspective projection this is done by means of projecting lines emanating from a single point, which may be infinity.

Projection, lambert conformal conic. A conformal projection of the conical type, on which all geographic meridians are represented by straight lines, which meet in a common point outside the limits of the map, and the geographic parallels are represented by a series of arcs of circles having this common point for a center. Meridians and parallels intersect at right angles, and angles on the earth are correctly represented on the projection.

Projection, mercator. A conformal projection of the cylindrical type. The equator is represented by a straight line true to scale; the geographic meridians are represented by parallel straight lines perpendicular to the line representing the equator; they are spaced according to their distance apart at the equator. The geographic parallels are represented by a second system of straight lines perpendicular to the family of lines representing the meridians, and therefore, parallel with the equator. Conformality is achieved by mathematical analysis, the spacing of the parallels being increased with the increasing distance from the equator to conform with the expanding scale along the parallels resulting from the meridians being represented by parallel lines. Since rhumb lines appear as straight lines and directions can be measured directly, this projection is widely used in navigation.

Projection, skewed. Any standard projection used in map or chart construction, which does not conform to a general north-south format with relation to the neatlines of the map or chart.

Promontory. High land extending into a large body of water beyond the line of the coast. Called *headland* when the promontory is comparatively high and has a steep face. Also called *foreland*.

Proportional dividers. An instrument consisting in its simple form of two legs pointed at both ends and provided with an adjustable pivot, so that for any given pivot setting, the distance between one set of pointed ends always bears the same ratio to the distance between the other set. A change in the pivot changes the ratio. The dividers are used in transferring measurements between charts or other

drawings which are not at the same scale.

Protractor, three-arm. An instrument consisting essentially of a circle graduated in degrees, to which is attached one fixed arm and two arms pivoted at the center and provided with clamps so that they can be set at any angle to the fixed arm, within the limits of the instrument. It is used for finding a ship's position, when the angles between three-fixed and known points are measured.

Province. A region composed of a group of similar bathymetric features whose characteristics are markedly in contrast with those of surrounding areas.

Publisher's note. A marginal note which indicates the publisher and usually place of publication.

Pumping platform complex (PPC). A single platform of a series of interconnected platforms that have one or more of the following capabilities: (1) pumping oil between a vessel and the shore; (2) berthing and messing facilities for assigned personnel; (3) landing area for helicopters; and (4) mooring and loading for small vessels.

Quartz. One of several descriptors of the "nature of the seabed" used in Chart No. 1. Quartz is crystalline silica. In its most common form it is colorless and transparent, but it takes a large variety of forms of varying degrees of opaqueness and color. It is the most common solid mineral. Part of the ocean bed is composed of quartz.

Quay. A structure of solid construction along a shore or bank which provides berthing for ships and which generally provides cargo-handling facilities. A similar facility of open construction is called a *wharf*. *See also:* **Mole.**

Quicksand. Loose, yielding, wet sand which offers no support to heavy objects. The upward flow of the water has a velocity that eliminates contact pressures between the sand grains and causes the sand-water mass to behave like a fluid.

Race. Swiftly flowing water in a narrow channel or river; also the channel itself which may be artificial as in a mill-race. Also a swift rush of water through a narrow channel in tidal waters and caused by the tidal movement of the waters. *See:* **Tide race.**

RACON (Radar Transponder Beacon). A radio-navigation system that transmits a coded signal which is displayed on the user's radar screen allowing him to identify the aid and determine the aid's

range and bearing.

Radar. An electronic system designed to transmit radio signals and receive reflected images of those signals from a “target” in order to determine the bearing and distance of the “target.”

Radar beacon. A radar transmitter whose emissions enable a ship to determine its direction and frequent position relative to the transmitter by means of the ship’s radar equipment. There are two general types of radar beacons. One type, the RACON, must be triggered by the ship’s radar emissions; the other type, the RAMARK, transmits continuously and provides bearings only.

Radar buoy. A buoy having corner reflectors designed into the superstructure, the characteristic shape of the buoy being maintained. This is to differentiate from a buoy on which a corner reflector is mounted.

Radar dome. A dome-shaped structure used to protect the antenna of a radar installation.

Radar reflector. A special fixture fitted to or incorporated into the design of certain aids to navigation to enhance their ability to reflect radar energy. In general, these fixtures will materially improve the aids for use by vessels equipped with radar.

Radiobeacon. Electronic apparatus which transmits a radio signal for use in providing a mariner a line of position.

Radiobeacon characteristic. The description of the complete cycle of transmission of a radiobeacon in a given period of time, inclusive of any silent period.

Radio direction finder (RDF). Radio receiving equipment which determines the direction of arrival of a signal by measuring the orientation of the wave front or of the magnetic or electric vector. Radio direction finders may be either manual or automatic. Also called *direction finder*. Formerly called *radio compass*.

Radio frequency. Any electromagnetic wave occurring within that segment of the spectrum normally associated with some form of radio propagation. Radio frequencies are usually classified as very low, 3 to 30 *kilohertz* (kHz); low, 30 to 300 kHz; medium, 300 to 3,000 kHz; high, 30 to 30 megahertz; very high, 30 to 300 megahertz; ultra high, 300 to 3,000 megahertz; super high, 3 to 30 gigahertz; extremely high, 30 to 300 gigahertz.

Radio mast. A radio mast is a tall structure held vertical by guylines.

Radionavigation. (1) The determination of position, or the obtaining of information relating to position, for the purposes of navigation by means of the propagation properties of radio waves. (2) As defined by the *International Telecommunication Union* (ITU), radiodetermination used for the purposes of navigation, including obstruction warning.

Radio station. A place equipped with one or more transmitters or receivers, or a combination of transmitters and receivers, including the accessory equipment necessary at one location, for carrying on a radiocommunication service. Each station is classified by the service in which it operates permanently or temporarily.

Radio tower. A radio tower is a latticed structure, which is self-supporting.

Ramp. A sloping structure that can either be used as a landing place, at variable water levels, for small vessels, landing ships, or a ferry boat, or for hauling a cradle carrying a vessel.

Range. (1) Two or more objects in line. Such objects are said to be “in range.” An observer having them in range is said to be “on the range.” Two beacons are frequently located for the specific purpose of forming a range to indicate a safe route or the centerline of a channel. Called *leading marks* in British terminology. (2) Distance in a single direction or along a great circle. (3) The extreme distance at which an object or light can be seen is called *visual range*. (4) The extreme distance at which a signal can be detected or used. The maximum distance at which reliable service is provided is called *operating range*. The spread of ranges in which there is an element of uncertainty of interpretation is called *critical range*. (5) The distance a craft can travel at cruising speed without refueling is called *cruising radius*. (6) The difference in extreme values of variable quantity. *See also: Range of tide.* (7) A series of mountains or mountain ridges is called *mountain range*. (8) A predetermined line along which a craft moves while certain data are recorded by instruments usually placed below the line, or the entire station at which such information is determined. *See also: Degaussing range.* (9) An area where practice firing of ordnance equipment is authorized. (10) On the seafloor, a series of ridges or seamounts.

Range, geographic(al). The greatest distance at which a light can be seen as a function of the curvature of the earth and heights of the light source and the observer.

- Range, luminous.** The greatest distance at which a light can be seen merely as a function of its luminous intensity, the meteorological visibility, and the sensitivity of the observer's eye.
- Range, nominal.** The luminous range of a light in a homogeneous atmosphere in which the meteorological visibility is 10-sea miles.
- Range of tide.** The difference in height between consecutive high- and low-tide waters. The mean range is the difference in the height between mean high water and mean low water.
- Rapid(s).** Portions of a stream with accelerated current where it descends rapidly but without a break in the slope of the bed sufficient to form a waterfall. Usually used in the plural.
- Ravine.** A gulch; a small gorge or canyon, the sides of which have comparatively uniform slopes.
- Reach.** The comparatively straight segment of a river or channel between two bends. That part of a winding river between the last bend and the sea is called a *sea reach*; that part between the harbor and the first bend is called a *harbor reach*.
- Rebuilt.** A fixed aid, previously destroyed, which has been restored as an aid to navigation.
- Reciprocal bearing.** A bearing differing by 180° or one measured in the opposite direction, from a given bearing.
- Recommended direction of traffic flow.** A traffic flow pattern indicating a recommended directional movement of traffic where it is impractical or unnecessary to adopt an established direction of traffic flow.
- Recommended track.** A route which has been specially examined to ensure so far as possible that it is free of dangers and along which ships are advised to navigate.
- Reduction of soundings.** Recorded soundings on hydrographic surveys are corrected for any departure from true depths attributable to the method of sounding or to a fault in the measuring apparatus and for the elevation of the tide or water level above or below the chart datum (tidal or stage correction).
- Reef.** A rocky or coral elevation dangerous to surface navigation which may or may not uncover at the sounding datum. A rocky reef is always detached from shore; a coral reef may or may not be connected with the shore.
- Reference datum.** A general term applied to any datum, plane, or surface used as a reference or base from which other quantities can be measured.
- Reference station.** A tide or current station for which independent daily predictions are given in the *Tide Tables* and *Tidal Current Tables*, and from which corresponding predictions are obtained for subordinate stations by means of differences and ratios. *See: Subordinate current station.*
- Register marks.** Designated marks, such as small crosses, circles, or other patterns applied to original copy prior to reproduction to facilitate registration of plates and to indicate the relative positions of successive impressions. Also called: *corner marks; corner ticks; register ticks; registration ticks; ticks.*
- Registration.** Correct positioning of one component of a composite map image in relation to the other components. Achieved, for example, by punching sets of holes, having a fixed horizontal relationship to each other, in each component sheet and then attaching the components together using specially designed fasteners.
- Relief.** (1) The elevations or the inequalities, collectively of a land surface; represented on graphics by contours, hypsometric tints, shading, spot elevations, hachures, etc. Similar inequalities of the ocean bed or their representation are called *submarine relief*. (2) The removal of a buoy from a station and the providing of another buoy having the operating characteristics authorized for that station.
- Relighted.** An extinguished aid returned to its advertised light characteristics.
- Relocated.** Authorized movement of an aid from one position to another in the immediate vicinity.
- Removable span bridge.** A bridge with a portable or pontoon span that can be removed or drawn aside.
- Repeatability.** (1) A measure of the variation in the accuracy of an instrument when identical tests are made under fixed conditions. (2) In a navigation system, the measure of the accuracy with which the system permits the user to return to a specified point as defined only in terms of the coordinates peculiar to that system.
- Repeatable accuracy.** In a navigation system, the measure of the accuracy with which the system permits the user to return to a position as defined only in terms of the coordinates peculiar to that system. For example, the distance specified for the repeatable accuracy of the system, such as LORAN-C is the distance between two LORAN-C positions established using the same stations and time-difference readings at different times. The correlation

between the geographical coordinates and the system coordinates may or may not be known.

Replaced. An aid previously off station, adrifts, or missing restored by another aid of the same type and characteristics.

Replaced (temporarily). An aid previously off station, adrift, or missing restored by another aid of different type and/or characteristic.

Representative fraction. The scale of a map or chart expressed as a fraction or ratio that relates unit distance on the map to distance measured in the same unit on the ground. Also called *natural scale*, *fractional scale*.

Reprint. A reprinting of a chart without revision, necessitated by the depletion of stock. The issue is an exact duplicate of the current issue with no changes in printing or publication dates.

Reset. A floating aid previously off station, adrift, or missing returned to its assigned position (station).

Restricted area. A specified area designated by appropriate authority and shown on charts, within which navigation is restricted in accordance with certain specified conditions. *See: Danger area; Prohibited area.*

Restricted waters. Areas which for navigational reasons such as the presence of shoals or other dangers confine the movements of shipping within narrow limits.

Retractable bridge. A bridge with a movable span that can be withdrawn horizontally or within the remaining structure of the bridge.

Reversing current. A tidal current which flows alternately in approximately opposite direction with a slack water at each reversal of direction. Currents of this type usually occur in rivers and straits where the direction of flow is more or less restricted to certain channels.

Revetment. Facing of stone or other material, either permanent or temporary, placed along the edge of a stream to stabilize the bank and to protect it from the erosive action of the stream.

Revised print. A chart issue that does not cancel a current edition; the revisions are minor, the edition number remains the same but the print date is changed, and the chart is designated a revised print of that chart. The date of a revised print is shown to the right of the edition date.

Revision. The process of bringing the information on a map up to date. Continuous revision: a system designed to keep the information on a map up to date at all times.

Revision cycle. The proposed time interval between successive revisions of a chart or map.

Rhythmic light. A light showing intermittently with a regular periodicity.

Ridge. A long and narrow elevation with steep sides; a long, narrow elevation of the seafloor, with steep sides and more irregular topography than a rise.

Right bank. That bank of a stream or river on the right of the observer when he is facing in the direction of flow, or downstream. *See also: Left bank.*

Rincon. Corner or cove; an angular recess or hollow bend in a mountain, riverbank, cliff, or the like. (Local in Southwest) (Sp. origin)

Riparian boundaries. Water boundaries, or boundaries formed by the sea or a river.

Riparian lands. Lands bordering on a river. The term "riparian" is also used as relating to the shore of the sea or other tidal water, or of a lake or other considerable body of water not having the character of a watercourse.

Rip current. A strong surface current flowing seaward from the shore. It usually appears as a visible band of agitated water and is the return movement of water piled up on the shore by incoming waves and wind. With the seaward movement concentrated in a limited band, its velocity is somewhat accentuated.

Riprap. A layer of broken rock, cobbles, boulders, or fragments of sufficient size and thickness to resist the erosive forces of flowing water or wave action. Such structures usually are used to protect channels with relatively high velocity flow, shores, slopes, slopes on dams, or outlets of structures.

Riprap mounds. Mounds of riprap maintained at certain light structures to protect the structures against ice damage and scouring action. Uncharted submerged portions present hazard to vessels attempting to pass extremely close aboard.

Rips. Agitation of water caused by the meeting of currents or by a rapid current setting over an irregular bottom. Called *tide rips* when a tidal current is involved.

Rise. A long, broad elevation that rises gently and generally smoothly from the seafloor.

- River.** A natural stream of water, or greater volume than a creek or rivulet, flowing in a more or less permanent bed or channel, between defined banks or walls, with a current which may either be continuous in one direction or affected by the ebb and flow of the tidal current.
- Road.** An open anchorage affording less protection than a harbor. Some protection may be afforded by reefs, shoals, etc. Often used in the plural.
- Rock.** (1) An isolated rocky formation on a single large stone, usually one constituting a danger to navigation. It may be always submerged, always uncovered, or alternately covered and uncovered by the tide. A pinnacle is a sharp-pointed rock rising from the bottom. (2) The naturally occurring material that forms the firm, hard, and solid masses of the ocean floor. Also, *rock* is a collective term for masses of hard material generally not smaller than 256 millimeters.
- Rock awash.** In NOAA terminology, a rock exposed at any stage of the tide between the datum of mean high water and the sounding datum, or one just bare at these datums. For cartographic purposes, in order that the charted symbols may reflect the most probable condition of the rock as seen by the mariner, rocks the summits of which are in the zone between 1 foot above mean high water and 1 foot below the sounding datum on the Atlantic and gulf coasts and 2 feet on the Pacific coast are shown as rocks awash.
- A rock that becomes exposed, or nearly so, between chart sounding datum and mean high water. In the Great Lakes, the rock awash symbol is used on charts for rocks that are awash, or nearly so, at low-water datum.
- Rotary current.** A tidal current that flows continually with the direction of flow changing through all points of the compass during the tidal period.
- Roundabout.** A routing measure comprising a separation point or circular separation zone and a circular traffic lane within defined limits. Traffic within the roundabout is separated by moving in a counterclockwise direction around the separation point or zone. A circular area within definite limits in which traffic moves in a counterclockwise direction around a specified point or zone.
- Route charts.** These NOAA charts are published in a single long, narrow sheet, printed front and back and folded. They are designed for river and narrow waterway coverage, and for much of the Intracoastal Waterways. Most are issued in a protective cardboard jacket.
- Routing.** A complex of measures concerning routes aimed at reducing the risk of casualties; it includes traffic separation schemes, two-way routes, tracks, areas to be avoided, inshore traffic zones, and deep-water routes.
- Routing system.** Any system of one or more routes and/or routing measures aimed at reducing the risk of casualties; it includes traffic separation schemes, two-way routes, recommended tracks, areas to be avoided, inshore traffic zones, roundabouts, precautionary areas, and deep-water routes.
- Ruin.** A structure in decayed or deteriorated condition resulting from neglect or disuse, or a damaged structure in need of repair. A ruin is considered hazardous if it extends over or into navigable waters and thus represents a danger to surface navigation.
- Rules of the road.** The International Regulations for Preventing Collisions at Sea, commonly called *Inland Rules of the Road*, and *Inland Rules of the Road* to be followed by all vessels while navigating upon certain inland waters of the United States. Also called *Rules of Navigation*.
- Saddle.** A low point on a ridge or crestline; a ridge connecting two higher elevations; a low point on a ridge or between seamounts.
- Safety lanes.** Specified sea lanes designated for use in transit by submarines and surface ships to prevent attack by friendly forces.
- Safety zones.** Established around *Outer Continental Shelf* (OCS) facilities being constructed, maintained, or operated on the OCS to promote the safety of life and property on the facilities, their appurtenances and attending vessels, and on the adjacent waters within the safety zones.
- Sailing charts.** These NOAA charts are published at a scale smaller than 1:600,000, and are intended for planning and for fixing the mariner's position as the coast is approached from the open ocean or for sailing along the coast between distant ports. The shoreline and topography are generalized and only offshore soundings, principal navigational lights and buoys, and landmarks visible at considerable distances are shown.
- Salt marsh.** Flat, poorly drained coastal swamps which are flooded by most high tides.
- Salt pans.** Shallow pools of brackish water used for

the natural evaporation of sea water to obtain salt.

Sanctuary, marine. Area established under provisions of the Marine Protection, Research, and Sanctuaries Act of 1972, Public law 92-532 (86 Stat. 1052), for the preservation and restoration of its conservation, recreational, ecological, or esthetic values. Such an area may lie in ocean waters as far seaward as the outer edge of the Continental Shelf, in coastal waters where the tide ebbs and flows, or in the Great Lakes and connecting waters, and may be classified as a habitat, species research, recreations and esthetic, or unique area.

Sand. One of several descriptors of the “nature of the seabed” used in Chart No. 1. Sediment consisting of small but easily distinguishable separate grains between 0.0625 and 2 mm in diameter. It is called *very fine sand* if the grains are between 0.0625 mm and 0.125 mm in diameter, *fine sand* if between 0.125 mm and 0.25 mm in diameter, *medium sand* if between 0.25 mm and 0.5 mm in diameter, *coarse sand* if between 0.50 mm and 1.0 mm in diameter, and *very coarse sand* if between 1.0 mm and 2.0 mm in diameter. *See also: Mud, Stones, Rock, Boulder.*

Sandwave. A large wavelike sediment feature in very shallow water and composed of sand. The wavelength may reach 100 meters; the amplitude is about 0.5 meter. Also called *megaripple*.

Scale. The relationship between a linear dimension on a chart and the actual dimension represented is expressed, usually, as a ratio. Thus, the ratio 1:10,000 or 1/10,000 means that one unit of measure on the chart represents 10,000 of the same unit on the surface of the earth. Just as 1:4 or 1/4 is larger than 1:8 or 1/8, a 1:40,000 scale chart is larger than 1:80,000-scale chart. Consequently, a large-scale chart will show chart features in more detail but will cover a smaller area; a smaller scale chart will be more generalized but will cover a larger area.

Scale, bar. A graduated line on a map, plan, photograph, or mosaic, by means of which actual ground distances may be determined. Also called *graphic scale* or *linear scale*.

Scale, border. A scale drawn along the border of a chart.

Scale, large. A scale involving a relatively small reduction in size. A large-scale chart is one covering a small area. The opposite is small scale.

Scale, logarithmic. A scale graduated in the logarithms of uniformly spaced consecutive numbers.

Scale, small. A scale involving a relatively large reduction in size. A small-scale chart is one covering a large area. The opposite is large scale.

Scarp. A steep slope extending over a considerable distance and marking the edge of a terrace, plateau, bench, etc.

Scarp, beach. An almost vertical slope along the beach caused by erosion of wave action. It may vary in height from a few inches to several feet, depending on wave action and the nature and composition of the beach.

Schist. One of several descriptors of the “nature of the seabed” used in Chart No. 1. Schist is a foliated crystalline metamorphic rock composed of layers of different minerals that splits into thin irregular plates. Schist offers variable holding quality.

Scouring basin. A basin in which a quantity of water is impounded during the flood tide and the contents retained until a suitable time, about low water, when the gates are opened again and a volume of water is let out to maintain desired depth of the entrance channel by scouring the bottom. Also called *sluicing pond*.

Sea. (1) A body of salt water more or less confined by continuous land or chains of islands and forming a region distinct from the great masses of water. (2) A body of water nearly or completely surrounded by land, especially if very large or composed of salt water. Sometimes called *inland sea*. (3) Ocean areas in general, including major indentations in the coastline, such as gulfs. (4) Waves generated or sustained by winds within their fetch as opposed to swell. (5) The character of a water surface, particularly the height, length (period), and direction of travel of waves generated locally.

Seaboard. The region of land bordering the sea. The terms *seaboard*, *coast*, and *littoral* have nearly the same meanings. Seaboard is a general term used somewhat loosely to indicate a rather extensive region bordering the sea. Coast is the region of indefinite width that extends from the sea inland to the first major change in terrain features. Littoral applies more specifically to the various parts of a region bordering the sea, including the coast, foreshore, backshore, beach, etc.

Sea buoy. The outermost buoy marking the entrance to a channel or harbor. Called *landfall buoy* in British terminology.

Sea gate. (1) A way giving access to the sea such as a gate, channel, or beach. (2) A gate which serves to protect a harbor or tidal basin from the sea, such

as one of a pair of supplementary gates at the entrance to a tidal basin exposed to the sea.

Sea mile. An approximate mean value of the nautical mile equal to 6,080 feet, or the length of a minute of arc along the meridian at latitude 48°. (British terminology: The length of one minute of arc, measured along the meridian in the latitude of the position; its length varies both with the latitude and with the figure of the earth in use.)

Sea wall. A structure separating land and water areas, primarily designed to prevent erosion and other damage due to wave action. *See also:* **Bulkhead.**

Seaward. Away from the land; toward the sea.

Seaward boundary. Limits of any area or zone offshore from the mean low, or mean lower low water line and established by an act of the U.S. Congress, or agreed to by treaty. *See:* **Mean low water line.**

Seaweed. One of several descriptors of the “nature of the seabed” used in Chart No. 1. Seaweed includes any of a large variety of weeds generally found in shallow waters. Seaweed has no holding power; anchors must pass through the weed to grip the underlying seabed. Anchors suitable for seaweed require a long, narrow fluke that penetrates deeply to reach the bottom. Care must be taken in anchoring in seaweed to ensure that the anchor penetrates to the bottom. Searching for an alternative location is often preferable to attempting to anchor in seaweed.

Secondary light. A major light, other than a primary seacoast light, established at harbor entrances and other locations where high intensity and reliability are required.

Security zone. All areas of land, water, or land and water, which are so designated by the Captain of the Port for such time as he deems necessary to prevent damage or injury to any vessel or waterfront facility, to safeguard ports, harbors, territories, or waters of the United States or to secure the observance of the rights and obligations of the U.S.

Sediment(s), bottom. In general all sedimentary material regardless of origin found on or in the submarine bottom, including ballast or other material dumped into the sea by man. More specifically it is limited to unconsolidated mineral and organic material forming the sea bottom, not including coral reefs or bedrocks.

Seiche. A stationary wave usually caused by strong winds and/or changes in barometric pressure. It is found in lakes, semienclosed bodies of water, and in

areas of the open ocean.

Semidiurnal. Having a period or cycle of approximately one-half of a tidal day. The predominant type of tide throughout the world is semidiurnal, with two high waters and two low waters each tidal day. The tidal current is said to be semidiurnal when there are two flood and two ebb periods each day.

Separation zone or line. A zone or line separating traffic proceeding in one direction from traffic proceeding in another direction. A separation zone may also be used to separate a traffic lane from the adjacent inshore traffic zone.

Setting a buoy. The act of placing a buoy on assigned position in the water.

Sewage. Human body wastes and the wastes from toilets and other receptacles intended to receive or retain body waste.

Shallow water. Commonly, water of such a depth that surface waves are noticeably affected by bottom topography. It is customary to consider water of depths less than half the surface wavelength as shallow water.

Shelf; Continental; Insular; Island. A zone adjacent to a continent (or around an island) and extending from the low-water line to a depth at which there is usually a marked increase of slope toward oceanic depths.

Shelf edge. A line along which there is a marked increase of slope at the outer margin of a continental shelf or an island shelf. (For charting purposes the 100-fathom depth contour is normally accepted as the shelf edge; the actual depth usually is less, but may be more.)

Shingle. One of several descriptors of the “nature of the seabed” used in Chart No. 1. *See under:* **Stones.**

Shipping lane. A term used to indicate the general flow of merchant shipping between two departure/terminal areas.

Ships' Routing. A publication of the *International Maritime Organization* (IMO), which describes the general provisions of ships' routing, traffic separation schemes, deep-water routes, and areas to be avoided, which have been adopted by IMO. All details of routing systems are promulgated through *Notices to Mariners*, together with their dates of implementation. Also details of routing system are depicted on charts and are given in *Sailing Directions*.

Shoal. (1) Shallow. (2) An offshore hazard to naviga-

tion on which there is a depth of 10 fathoms or 20 meters or less, composed of unsolidated material, except coral or rock. *See: Reef.*

Shoaling. A bottom effect, which describes the height of the waves, but not the direction. It can be divided into parts which occur simultaneously. The one part has to do with the fact that waves become less dispersive close to shore; therefore, since the same energy can be carried by high waves of lesser height, this effect causes a gradual decrease in the wave height. In the other part, the waves slow down, the crests move closer together, and since the energy between crests remain relatively fixed, the waves can become higher near shore. These effects are evidenced in the initial decrease in height of the incoming wave, then an increase in height as the wave comes into shore.

Shore. That part of the land in immediate contact with a body of water including the area between high- and low-water lines. The term *shore* is usually used with reference to the body of water and coast with reference to the land, as the east coast of the United States is part of the western shore of the Atlantic Ocean. The term *shore* usually refers to a narrow strip of land in immediate contact with any body of water, while coast refers to a general region in proximity to the sea. A shore bordering the sea may be called a *seashore*. *See also: Foreshore; Backshore.*

Shoreface. The narrow zone seaward from the low tide shoreline, permanently covered by water, over which the beach sands and gravels actively oscillate with changing wave conditions.

Shoreline. The line of contact between the land and a body of water. On NOAA nautical charts and surveys, the shoreline approximates the mean highwater line. In NOAA usage, the term is considered synonymous with "coastline." *See: Mean high water line.*

Short-range systems. Those radionavigation systems limited in their positioning capability to coastal regions, or those systems limited to making landfalls. Radar and radio direction finder are examples.

Significant. A condition or situation that could have a material consequence for the chart user. A significant error, for example, could lead to an erroneous, even dangerous use of the chart.

Sill. On the seafloor the low part of a gap or saddle separating basins. *See also: Dock sill.*

Sill depth. The greatest depth over a sill.

Silt. One of several descriptors of the "nature of the seabed" used in Chart No. 1. *See under: Stones.*

Single station range light. A direction light bounded by other sectors of different characteristics which define its margins with small angles of uncertainty. Most commonly the bounding sectors are of different colors (red and green).

Sink, sinkhole. A depression which has subsurface drainage only, through natural holes and caverns in limestone or by seepage into a lower lying water table.

Skeleton tower. A tower, usually of steel, constructed of heavy corner members and various horizontal and diagonal bracing members.

Slack water (slack). The state of a tidal current when its speed is near zero, especially the moment when a reversing current changes direction and its speed is zero.

Slip. A berthing space between two piers. Also called *dock*.

Slipway. A structure in a shipyard on which vessels are constructed so that when finished they may be slid into the water.

Slope. On the seafloor, the slope seaward from the shelf edge to the beginning of a continental or insular rise or the point where there is a general reduction in slope.

Slough. A minor marshland or tidal waterway which usually connects other tidal areas; often more or less equivalent to a bayou.

Sluice. Sliding gate or other contrivance for changing the level of a body of water by controlling flow into or out of it.

Small-craft nautical charts. These charts are published by NOAA at scales from 1:10,000 to 1:80,000 and are designed for easy reference and plotting in limited spaces. In some areas these charts represent the only chart coverage for all marine users. They portray regular nautical chart detail and other specific details of special interest to small-craft operators, such as enlargements of harbors; tide, current, and weather data; rules-of-the-road information; locations of marine facilities; anchorages; courses; and distances.

Snag. A tree or branch embedded in a river or lake bottom and not visible on the surface, forming thereby a hazard to boats.

Sound. A relative long arm of the sea or ocean form-

ing a channel between an island and a mainland or connecting two larger bodies of water, as a sea and the ocean, or two parts of the same body but usually wider and more extensive than strait. The term has been applied to many features which do not fit the accepted definition. Many are very large bodies of water, such as Mississippi Sound and Prince William Sound, others are mere salt water ponds or small passages between islands.

Sound buoy. A buoy equipped with either a gong, bell, whistle, or electronic horn. Bells and gongs on buoys are sounded by tappers that hang from the tower and swing as the buoys roll in the sea. Bell buoys produce a sound of only one tone; gong buoys produce several tones. Whistle buoys make a loud moaning sound caused by the rising and falling motions of the buoy in the sea. A buoy equipped with an electronic horn, a horn buoy, will produce a pure tone at regular intervals and will operate continuously regardless of the sea state.

Sounding. Measured or charted depth of water, or the measurement of such depth. A no-bottom sounding is one in which the bottom is not reached. A vessel is said to be on soundings when it is navigating primarily by means of the information obtained by successive measurements of the depth of the water, or is in an area where this can be done. In other areas a vessel is said to be “off soundings.”

Sounding, danger. A minimum sounding chosen for a vessel of specific draft in a given area to indicate the limit of safe navigation.

Sounding, doubtful. A depth shown on a chart over a shoal, a rock, etc., that may be less than that indicated.

Sound signal. A sound transmitted in order to convey information as a fog signal. The term *sound signal* is sometimes used to describe the apparatus generating the sound.

Special-purpose buoy. A buoy having no lateral significance used to indicate a special meaning to the mariner which must be determined from appropriate nautical documents.

Spheroid. An ellipsoid; a figure resembling a sphere. Also called *ellipsoid* or *ellipsoid of revolution*, from the fact that it can be formed by revolving an ellipse about one of its axes. If the shorter axis is used as the axis of revolution, an oblate spheroid results, and if the longer axis is used, a prolate spheroid results. The earth is approximately an oblate spheroid.

Spire. A label on a nautical chart which indicates a pointed structure extending above a building. The spire is seldom less than two-thirds of the entire height and its lines are rarely broken by stages or other features. The term is not applied to a short pyramid-shaped structure rising from a tower or belfry.

Spit. A small tongue of land or a narrow shoal (usually sand) extending from the shore into a body of water. Generally the tongue of land continues in a long narrow shoal for some distance from the shore.

Spoil. Mud, sand, silt or other deposits obtained from the bottom of a channel of harbor by dredging.

Spoil area. Area for the purpose of depositing dredged material, usually near and parallel to dredged channels. Spoil areas are usually a hazard to navigation and navigators of even the smallest craft should avoid crossing these areas. Spoil areas are shown on nautical charts. *See also: Dumping ground; Dump site.* Also called *spoil ground*.

Spoil banks. Submerged accumulations of dumped material dredged from channels or harbors.

Spoil ground. *See: Spoil area.*

Spot elevation. A point on a map or chart whose height above a specified datum is noted, usually by a dot or a small sawbuck and elevation value.

Spring. A place where water issues naturally from the rock or soil upon the land or into a body of surface water.

Spring tides or tidal currents. Tides of increased range or tidal currents of increased speed occurring semimonthly as the result of the moon being new or full.

Spur. A subordinate elevation, ridge, or rise projecting outward from a larger feature.

Stack. A label on a nautical chart which indicates a tall smokestack or chimney. The term is used when the stack is more prominent as a landmark than the accompanying buildings.

Stake. An elongated wood or metal pole embedded in the bottom to serve as a marker or support for fish nets.

Stand of tide. Sometimes called a *platform tide*. An interval at high or low water when there is no sensible change in the height of the tide.

Standpipe. A label on a nautical chart which indi-

cates a tall cylindrical structure, in a waterworks system, the height of which is several times the diameter.

Starboard. The right side of a craft, facing forward. The opposite is port.

Station buoy. An unlighted buoy set near a lightship or an important buoy as a reference point should the primary aid be moved from its assigned position.

Station, reference. A place where tide or tidal current constants have been determined from observations, and which is used as a standard for the comparison of simultaneous observations at a subordinate station. It is also a place for which independent daily predictions are given in the tide or tidal current tables, from which corresponding predictions are obtained for other locations by means of differences or factors. Also called *standard station* and *standard port* (British terminology).

Stones. One of several descriptors of the “nature of the seabed” used in Chart No. 1. A general term for rock fragments ranging in size from 2 mm to 256 mm. An individual stone is called a *cobble* if between 64 mm and 256 mm, a *pebble* if between 4 mm and 64 mm, and *gravel* if between 2 mm and 4 mm. An aggregate of stones ranging from 16 mm to 256 mm is called *shingle*.

Strait. A relatively narrow waterway, usually narrower and less extensive than a sound, connecting two larger bodies of water.

Stranded and sunken. These terms apply exclusively to items that once possessed the ability to float but which are now resting on the bottom. Stranded items project above the sounding datum. Sunken items do not project above the sounding datum. These terms apply most often to wrecks. Masts, funnels, and other extensions of wreck superstructure should be disregarded when applying the above definitions; these features may be above the sounding datum and still have the wreck classified as “sunken.”

Stranding. The destruction or loss of a vessel by its being sunk or broken up by the violence of the sea or by its striking or stranding upon a rock, shoal, or the like. The term “stranding” refers most particularly to the driving or running aground of a vessel. It may be either accidental or voluntary. Voluntary stranding takes place where the ship is run aground either to avoid a more serious fate, or for some fraudulent purpose. In marine insurance,

a “touch-and-go” is not considered a stranding. In order to constitute a stranding, the ship must be stationary for a certain length of time.

Stream. Any river, brook, rivulet, or course of running water. A steady current in the sea or in a river, especially the middle or most rapid part of a tide or current.

Stream channel. The bed where a natural stream of water runs; the trench or depression washed in the surface of the earth by running water; a wash, arroyo, or coulee.

Strobe light. Many charted features marked with ultrabright flashing lights of extremely short duration. These bright flashes are produced by a strobe light device usually a xenon gas condenser-discharge flash lamp or flash tube. Xenon flash tubes are unique light sources capable of firing extremely power flash. The flash is almost similar to the spectral distribution of light of the sun, which ranges from ultraviolet to infrared regions. The duration of the flash is controlled from some microseconds up to scores of milliseconds. Strobe lights are used on certain U.S. Coast Guard maintained aids to navigation and on potential aero hazards such as stacks, towers, and builds. The terms “Flick” and “Flash Tube” as used in U.S. Coast Guard *Notice to Mariners* are considered to have strobe light characteristics for the purpose of nautical chart labeling. Aids published in *Notice to Mariners* and *Light Lists* as well as landmarks with the above characteristics are identified on nautical charts with the label “Strobe” incorporated within the label of the particular feature.

Structure. The term “structure” includes, without limitation, any pier, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other obstacle or obstruction.

Submarine cable. An insulated, waterproofed wire or bundle of wires for carrying an electric current under water. Such a cable is placed on or near the bottom.

Submarine valley (also called Seavalley). A depression in the sea bottom of broad valley form without the steep side slopes which characterize a canyon.

Submerged. Under water; not showing above water. The opposite is “uncovered.”

Submerged lands. Lands covered by water at any

- stage of the tide, as distinguished from tidelands which are attached to the mainland or an island and cover and uncover with the tide. Tidelands presuppose a high-water line as the upper boundary, submerged lands do not.
- Submerged production well.** An oil or gas well that is a seabed installation only, i.e., the installation does not include a permanent production platform.
- Submerged rock.** A rock covered at the chart sounding datum and considered to be potentially dangerous to navigate. *See also:* **Bare rock; Rock awash.**
- Subordinate current station.** (1) A current station from which a relatively short series of observations is reduced by comparison with simultaneous observations from a control current station. (2) A station listed in the *Tidal Current Tables* for which predictions are to be obtained by means of differences and ratios applied to the full predictions at a reference station. *See:* **Reference station.**
- Summit.** The highest point, part of elevation; top or apex.
- Sunken rock.** A rock potentially dangerous to surface navigation, the summit of which is below the lower limit of the zone for a rock awash.
- Super-buoy.** A very large buoy, generally more than 5 meters in diameter. Its large size renders a super-buoy a potential hazard even to large vessels. The three principal types of super-buoy are: large navigational buoy, offshore tanker loading/discharge buoy (or single-point mooring), and the *oceanographic data acquisition system* (ODAS) buoy.
- Survey, wire-drag.** A hydrographic survey made utilizing a wire drag. In areas of rocky bottom or where submerged obstacles such as wrecks are present, a wire-drag survey represents the most practical way of making sure that all obstructions or dangers have been found and least depths over them obtained. Also called *wire-drag sweep*.
- Suspension bridge.** A bridge suspended from chains or cables which are anchored at either end and supported by towers at regular intervals.
- Swamp.** A track of stillwater abounding in certain species of trees and coarse grass or boggy protuberances; a track of wet, spongy land, saturated, but not usually covered with water; a boggy marshland and stream; a slough.
- Swash.** A narrow channel or sound within a sand bank, or between a sand bank and the shore. Also called *swashway*. A bar over which the sea washes. The rush of water up onto a beach following the breaking of a wave.
- Swash channel.** (1) On the open shore, a channel cut by flowing water in its return to the parent body (e.g., a rip channel). (2) A secondary channel passing through or shoreward of an inlet or river bar.
- Sweep.** To drag. Drag and sweep have nearly the same meanings. *Drag* refers particularly to the location of obstructions, or the making sure that obstructions do not exist. *Sweep* may include, additionally, the removal of any obstruction located.
- Sweeping.** The process of towing a line or object below the surface, to determine whether an area is free from isolated submerged dangers to vessels and to determine the position of any such dangers that exist, or to determine the least depth of an area. The process of clearing an area or channel of mines or other dangers to navigation.
- Swing bridge.** A bridge that can be swung in a horizontal plane to allow tall vessels to pass.
- Tableknoll.** A seamount rising less than 500 fathoms from the seafloor and having a comparatively smooth, flat top with minor irregularities.
- Tablemount.** A seamount rising more than 500 fathoms from seafloor and having a comparatively smooth, flat top with minor irregularities.
- Terrace.** On the seafloor, a relatively flat, horizontal or gently inclined surface, sometimes long and narrow, which is bounded by a steeper ascending slope on one side and by a steeper descending slope on the opposite side.
- Territorial sea (also called Marginal sea, [Adjacent sea.] Marine belt, Maritime belt, and Three-mile limit).** The water area bordering a nation over which it has exclusive jurisdiction, except for the right of innocent passage of foreign vessels. It is a creation of international law, although no agreement has thus far been reached by the international community regarding its width. It extends seaward from the low-water mark along a straight coast and from the seaward limits of inland waters where there are embayments. The United States has traditionally claimed 3-nautical miles as its width and has not recognized the claims of other countries to a wider belt.
- Territorial waters.** Includes the territorial sea (marginal sea) and the inland waters of a country (lakes, rivers, bays, etc.). Sometimes used as synonymous

with **Territorial sea.**

Thorofare. This shortened form of thoroughfare has become standard for a natural waterway in marshy areas. It is the same type of feature as a slough or bayou.

Three-arm protractor. An instrument consisting essentially of a circle graduated in degrees, to which is attached one fixed arm and two arms pivoted at the center and provided with clamps so that they can be set at any angle to the fixed arm, within the limits of the instrument. It is used for finding a ship's position when the angles between three fixed and known points are measured. Also called *station pointer*.

Tidal basin. A basin without a caisson or gate in which the level of water rises and falls with the tides. Also called *open basin*. *See also: Tidal harbor; Nontidal basin.*

Tidal current. A horizontal movement of the water caused by gravitational interactions between the sun, moon, and earth.

Tidal current chart diagrams. A series of 12 monthly diagrams to be used with the Tidal Current Charts. Each diagram contains lines that indicate the specific tidal current chart of each series to use, and speed factor to apply to that chart.

Tidal current charts. (1) Charts on which tidal current data are depicted graphically. (2) Tidal current chart; as published by NOAA, part of a set of 12 charts which depict, by means of arrows and figures, the direction and velocity of the tidal current for each hour of the tidal cycle.

Tidal Current Tables. (1) Tables which give the predicted times of slack water and the predicted times and velocities of maximum current flood and ebb for each day of the year at a number of reference stations, together with time differences and velocity ratios for obtaining predictions at subordinate stations. (2) Tidal Current Tables; published annually in two volumes; Atlantic Coast of North America; Pacific coast of North America and Asia.

Tidal cycle. A complete set of tidal conditions as those occurring during a tidal day, lunar month, or Metonic cycle.

Tidal datum. Specific tide levels which are used as surfaces of reference for depth measurements in the sea and as a base for the determination of elevation on land. Many different datums have been used, particularly for leveling operations. Also called *tidal*

datum plane.

Tidal flat. A marsh or sandy or muddy coastal flatland which is covered and uncovered by the rise and fall of the tide.

Tidal harbor. A harbor affected by the tides, in distinction from a harbor in which the water level is maintained by caissons or gates. *See also: Nontidal basin.*

Tidal waters. All waters which flow and reflow under the influence of the tides. Arms of the sea, bays, creeks, coves, or rivers in which the tide ebbs and flows are properly denominated tidal waters. The term tidal water is not limited to water which is salt, but embraces also so much of the water of fresh rivers as is propelled backward by the ingress and pressure of the tide. Also called *tide waters*.

Tide. The periodic rise and fall of the water resulting from gravitational interactions between the sun, moon, and earth. The vertical component of the particulate motion of a tidal wave.

Tide lock. A lock situated between a basin or canal and tidewater to maintain the water at a desired level as the height of the tide changes. Also called *guard lock*.

Tide race. A very rapid tidal current through a comparatively narrow channel. Also called *race*.

Tide rips. Small waves formed on the surface of water by the meeting of opposing tidal currents or by a tidal current crossing an irregular bottom. Vertical oscillation, rather than progressive waves, is characteristic of tide rips. *See also: Rips.*

Tide station. (1) The geographic location at which tidal observations are made. (2) The equipment used to make tidal observations and its housing.

Tide tables. Tables which give the predicted times and heights of high and low water for every day in the year for a number of reference stations, and tidal differences and ratios by which additional predictions can be obtained for subordinate stations. From these values it is possible to interpolate by a simple procedure the height of the tide at any hour of the day. *See also: Tidal Current Tables.*

Toe (engineering). Terminal edge or edges of a structure.

Tongue. A long, narrow strip of land, projecting into a body of water; a long, narrow body of water indenting the land or bounded by islands.

- Topographic map.** A map which presents the vertical position of features in measurable form as well as their horizontal positions.
- Topography.** (1) The configuration of the surface of the earth, including its relief, the position of its stream, roads, cities, etc. The earth's natural and physical features collectively. A single feature, such as a mountain or valley, is termed a *topographic feature*. Topography is subdivided into hypsography (the relief features), hydrography (the water and drainage features), culture (artificial features), and vegetation. (2) The science of delineation of natural and artificial features of a place or region especially in a way to show their positions and elevations.
- Track.** (1) The intended or desired horizontal direction of travel with respect to the earth. The track as expressed in degrees of the compass may be different from the course due to such factors as making allowance for current sea or steering to resume the track. (2) The path of intended travel with respect to the earth as drawn on the chart. Also called *intended track*, *trackline*. (3) The actual path of a vessel over the ground.
- Traffic lane.** An area within defined limits in which one-way traffic is established. Natural obstacles, including those forming separation zones, may constitute a boundary.
- Traffic separation scheme.** A scheme which separates traffic proceeding in opposite or nearly opposite directions by the use of a separation zone or line, traffic lanes or by other means. Shipping corridors marked by buoys, which separate incoming from outgoing vessels. Improperly called "sea lanes."
- Trench.** A long, narrow, characteristically very deep and asymmetrical depression of the seafloor, with relatively steep sides. *See also: Trough.*
- Trough.** (1) A long depression of the seafloor, characteristically flat bottomed and steep sided, and normally shallower than a trench. (2) The lowest part of a wave, between two crests is called *wave trough*.
- True north.** The direction from any observer's position to the geographical North Pole. The north direction of any geographic meridian.
- Tule.** Reed. Bulrush. A place where reeds grow. Corruption of Spanish *Tulares*.
- Tundra.** One of the level or undulating treeless plains characteristic of arctic regions, having a black muck soil with a permanently frozen subsoil.
- Turning basin.** A water area used for turning vessels.
- Two-way route.** A route within defined limits, inside which two-way traffic is established, aimed at providing safe passage of ships through waters where navigation is difficult or dangerous.
- Under construction.** The term used to indicate that the feature on the map is not completed but that construction has started. It is distinguished from "proposed," which means that the feature has been planned but construction has not been started.
- Uniform state waterway marking system.** A system developed jointly by the U.S. Coast Guard and state boating administrators to assist the small-craft operator in those state waters marked by participating states. It consists of two categories of aids to navigation. One is a system of aids to navigation, generally compatible with the federal lateral system of buoyage, to supplement the federal system in state waters. The other is a system of regulatory markers to warn the small-craft operator of dangers or to provide general information and directions.
- United States Army Corps of Engineers (USACE).** The *Commanding General, United States Army Corps of Engineers* (CGUSACE) serves as the Army's Real Property Manager, performing the full-cycle of real property activities (requirements, programming, acquisition, operation, maintenance, and disposal); manages and executes engineering, construction, and real estate programs for the Army and the United States Air Force; and performs research and development in support of these programs. CGUSACE manages and executes Civil Works Programs. These programs include research and development, planning, design, construction, operation and maintenance, and real estate activities related to rivers, harbors and waterways; administration of laws for protection and preservation of navigable waters and related resources such as wetlands. CGUSACE assists in recovery from natural disasters.
- United States Coast Guard (USCG).** The U.S. Coast Guard, established by the Act of January 28, 1915 (14 U.S.C. 1), became a component of the U.S. Department of Transportation on April 1, 1967, pursuant to the U.S. Department of Transportation Act of October 15, 1966 (80 Stat. 931). The Coast Guard is a branch of the Armed Forces of the United States at all times and is a service within the U.S. Department of Transportation except when operating as part of the Navy in time of war or when the President of the United States directs.

U. S. Coast Pilot. A descriptive book for the use of mariners, containing detailed information of coastal waters, harbor facilities, etc., of an area. Such books are prepared by NOAA for waters of the United States and its possessions.

Unsurveyed area. Areas on a map or chart where both relief and planimetric data are unavailable. These areas are usually labeled "unsurveyed." Or an area on a map or chart which shows little or no charted data because accurate information is limited or not available.

Upland. A highland; ground elevated above the lowlands along a river or between hills.

Upper limit of navigability. The character of a river will, at some point along its length, change from navigable to nonnavigable. Very often that point will be at a major fall or rapids, or other place where there is a marked decrease in the navigable capacity of the river. The upper limit will therefore often be the same point traditionally recognized as the head of navigation, but may, under some of the tests described above, be at some point yet farther upstream.

Upwelling. An upward flow of subsurface water due to such cases as divergences, offshore winds, and wind drift transports away from shore.

Urban area. An area predominantly occupied by artificial structures used for residential, commercial, and industrial purposes.

Valley. On the seafloor, a relatively shallow, wide depression, the bottom of which usually has a continuous gradient. This term is generally not used for features that have canyonlike characteristics for a significant portion of their extent.

Variation. (1) The angle between the magnetic and geographic meridians at any place, expressed in degrees and minutes east or west to indicate the direction of magnetic north from true north. The angle between magnetic and grid meridians is called *grid magnetic angle*, *grid variation*, or *grivation*. Called *magnetic variation* when a distinction is needed to prevent possible ambiguity. Also called *magnetic declination*. (2) Change or difference from a given value.

Vertical lift bridge. A bridge with a movable span between two lift towers such as the entire span can be raised uniformly in the vertical direction.

Vessel. Includes every description of watercraft or other artificial contrivance used, or capable of be-

ing used, as a means of transportation on the waters of the United States.

Vessel traffic service (VTS) area. Prescribe rules for vessel operation in order to prevent collisions and groundings and to protect the navigable waters of the VTS area from environmental harm from collisions and grounds.

Viaduct. A structure consisting of a series of arches or towers supporting a roadway, waterway, etc., across a depression, etc. *See also: Causeway.*

Visibility. That property of the atmosphere which determines the ability of an observer to see and identify prominent objects by day, or lights or lighted objects by night. A measure of this property is expressed in units of distance. This term should not be confused with *visual range*.

Visual range (of a light). The predicted range at which a light can be observed.

Volcano. An opening in the earth from which hot gases, smoke, and molten material issue, or a hill or mountain composed of volcanic material. A volcano is characteristically conical in shape with a crater in the top.

Warp. To move, as a vessel, from one place to another by means of lines fastened to an object, such as a buoy, wharf, etc., secured to the ground.

Warping buoy. A buoy so located that lines to it can be used for the movement of ships.

Wash. The dry channel of an intermittent stream.

Watching properly. An aid on its assigned position exhibiting the advertised characteristics in all respects.

Waterfront. Land at the end of a stream harbor, etc. The part of a city or town on such land; wharf or dock area.

Waterfront facility. All piers, wharves, docks, and similar structures to which a vessel may be secured; areas of land, water, or land and water under and in immediate proximity to them; buildings on such structures or contiguous to them and equipment and materials on such structures or in such buildings.

Water line. The line marking the junction of water and land.

Watershed. The area drained by a stream.

Waterway. A water area providing a means of trans-

portation from one place to another, principally a water area providing a regular route for water traffic, such as a bay, channel, passage, or the regularly traveled parts of the open sea. The terms waterway, fairway, and thoroughfare have nearly the same meanings.

Way point. A mark or place at which a vessel is required to report to establish its position. (Also known as “reporting point” or “calling-in-point.”)

Weir. A sort of fence set in a stream or along a shore line to catch fish. It differs from a pound because it is mainly constructed of brush hedging or narrow boards with or without nettings. The terms weir and pound are, to a great extent, used interchangeably in the United States. Also called *brush weir*, *fish weir*. Fish weirs are fixed solid structures made of stones or stakes and wattlings, or a combination of both. The simple form is a “Y” with the end toward high-water mark and the apex toward low water. In the apex there is very often a special cage or trap for the concentration or retention of the catch. Coastal weirs are generally built where there is a large expanse of ground left uncovered at low water. Weirs are usually kept in position all year round.

Weir jetty. An updrift jetty with a low section or weir over which littoral drift moves into a predredged deposition basin which is dredged periodically.

Wellhead. A submarine structure projecting some distance above the seabed and capping a temporarily abandoned or suspended oil or gas well. *See also: Submerged production well.*

Wetlands. Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wharf. A structure of open, rather than solid construction, along a shore or bank which provides berthing for ships and which generally provides cargo-handling facilities. A similar facility of solid construction is called quay.

Winter light. A light which is maintained during those winter months when the regular light is extinguished. It is of lower candlepower than the regular light but usually of the same characteristic.

Winter marker. A lighted or unlighted buoy without

sound signal, which is established as a replacement during the winter months when other aids are closed or withdrawn.

Wire drag. An apparatus for surveying rock areas where the normal sounding methods are insufficient to insure the discovery of all existing obstructions, pinnacles, rocks, etc., above a given depth or for determining the least depth of an area. It consists essentially of a buoyed wire towed at the desired depth by two launches. Often shortened to drag.

Withdrawn. The discontinuing of a floating aid during severe ice conditions or for the winter season.

World Geodetic System 1972 (WGS 72) A system comprised of a consistent set of parameters describing the size and shape of the earth, the positions of a network of points with respect to the center of mass of the earth, transformations from major geodetic datums, and the potential of the earth (usually in terms of harmonic coefficients). WGS 72 represents the *Defense Mapping Agency's* (DMA's) modeling of the earth from a geometric, geodetic, and gravitational standpoint using data available in 1972.

World Geodetic System 1984 (WGS 84). A system comprised of a consistent set of parameters describing the size and shape of the earth, the positions of a network of points with respect to the center of mass of the earth, transformations from major geodetic datums, and the potential of the earth (usually in terms of harmonic coefficients). WGS 84 represents the U.S. *Defense Mapping Agency's* (DMA's) modeling of the earth from a geometric, geodetic, and gravitational standpoint using data, techniques, and technology available in 1984.

Wreck. The ruined remains of a vessel which has been rendered useless, usually by violent action, as by the action of the sea and weather on a stranded or sunken vessel. In hydrography the term is limited to a wrecked vessel, either submerged or visible, which is attached to or foul of the bottom or cast up on the shore.

Wreck buoy. A buoy marking the position of a wreck. It is usually placed on the seaward or channel side of the wreck and as near to the wreck as conditions will permit. To avoid confusion in some situations, two buoys may be used to mark the wreck. The possibility of the wreck having shifted position due to sea action between the times the buoy was established and later checked or serviced should not be overlooked.

Wrecks. Charted wrecks are of two kinds: stranded wreck, where any portion of the hull is above the chart datum; and sunken wreck, where the hull is below the chart datum or where the masts only are visible.

X-axis. A horizontal axis in a system of rectangular coordinates; that line on which distances to the right or left (east or west) of the reference line are marked, especially on a map, chart, or graph.

Yard. A fundamental unit of length in the English system of measurement. The metric equivalent prior to July 1, 1959, was 1 yard = 0.91440183 meter. On that date the value was changed to 1 yard = 0.9144 meter. This change will not apply to any data expressed in feet derived from and published as a result of geodetic surveys within the United States until such time as the basic geodetic survey networks are readjusted. *See: Mile, nautical.*

Y-Axis. A vertical axis in a system of rectangular coordinates; that line on which distances above or below (north or south of) a reference line are marked, especially on a map, chart, or graph. The line which is perpendicular to the X-axis and passes through the origin.

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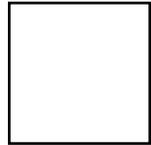
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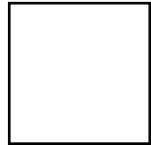
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